The RUBBER AGE

June, 1942

"UNITED WE STAND"

Newsletter No. 6 *PUBLISHED BY RUBBER CHEMICALS DIVISION OF* DUPONT *JUNE 1942*

Neoprene Latex is Adaptable to Principal Rubber Latex Manufacturing Processes

NEOPRENE latex has been used for years in the manufacture of various products requiring the valuable characteristics of neoprene. Additional production experience with neoprene latex should be gained now against the time when the present stocks of rubber latex have been depleted. Over ten years of experience in the field and research in the laboratory has resulted in the development of basic information covering all of the accepted processes for the manufacture of products from latex.

NEOPRENE LATEX TYPE 57 is an alkaline aqueous dispersion of neoprene of good mechanical and chemical stability. It contains 50% solids by weight and is slightly "thinner" than rubber latex of similar concentration.

Articles may be made from neoprene latex by dipping, electrodeposition, gelation, or other types of molding.* Fabrics or other fibrous materials may be spread-coated or impregnated with neoprene latex compounds.

COMPOUNDING NEOPRENE LATEX Neoprene latices are supplied only uncompounded and must be compounded prior to use to obtain the desired results. The base formula shown may be varied to meet the requirements of most applications.

NEOPRENE (from TYPE 57 LATEX)	100.00 (dry wt.)
NEOZONE D	2.
Lithopone	10.
Zinc Oxide	5.
Sulfur	2.
TEPIDONE	1.66

PHYSICAL TEST DATA			
Air Cure at 284° F. minutes	Modulus at 600% el. p.s.i.	Tensile Strength p.s.i.	Elongation at Break per cent
15	550	3700	900
30	625	3975	880
60	800	4275	870

VULCANIZATION of neoprene latex may be accomplished in air or steam. Films should first be dried in air at temperatures below 50° C. (122° F.). While films dried at 50° C. have fair tensile strengths, optimum physical properties can only be obtained by curing at temperatures above the boiling point of water. The preferred curing temperature is 140° C. (284° F.).

DIPPED GOODS may be produced from neoprene latex compounds by the conventional processes. While straight dipping in a thickened mix produces satisfactory results, as with rubber latex, one of the patented coagulating dip processes is generally preferred for large-scale production.

MOLDING BY GELATION can be readily accomplished with Neoprene Latex Type 57 or Type 60. The addition of 4.0% sodium fluosilicate causes Neoprene Latex Type 57 compounded according to the above basic formula to gel in two to three minutes at room temperatures. Other common gelling agents are also effective.

COATINGS AND IMPREGNATIONS of neoprene are often desired to improve appearance, bind a loose matrix of fibers, or make fabrics oil, chemical and waterproof.

NEOPRENE LATEX TYPE 60 is a special-purpose latex similar to Type 57 except that it contains approximately 60% solids. Neoprene Latex Type 60 is particularly valuable in gelation processes including the manufacture of froth-sponge articles.

THE DUPONT RUBBER LABORATORY, its facilities and broad experience with latex are available to assist in developing essential products from neoprene latex.

**Certain processes utilizing rubber latex and/or neoprene latex are protected by patents recognized to be valid. Neoprene latex is offered for sale on the condition that it shall not be used in such a manner as to infringe any valid patent.*

Typical articles made from neoprene latex: (1) Bulb molded by gelation process; (2) Extruded latex thread; (3) Dipped chemical work glove; (4) Coagulating dip surgeon's glove; (5) Cork gasket dip coated; (6) Corrosion resistant metal coating.

Through the Mill

PRIORITIES—*Preference Rating Certificates or formal priority information must accompany all orders for the following chemicals:*

Retarder W
Heliozone
Aquarex MDL Paste

In order to avoid unnecessary delay in filling orders, please be sure all orders for these materials are accompanied by the necessary priority information presented in the form prescribed by the War Production Board for the particular rating you are operating under.

RECLAIMED RUBBER *stocks that will calendar and extrude smoothly are usually hard to obtain unless they are highly loaded with fillers or softeners. By first plasticizing the reclaimed rubber with RPA No. 3 it is possible to prepare even lightly loaded reclaim stocks that will process satisfactorily. For details on the use of RPA No. 3 for this purpose ask for our report entitled "Plasticization of Reclaimed Rubber with RPA No. 3."*

STIFFENING *uncured neoprene stocks is sometimes desirable to facilitate handling hose tubes through braiders and looms with a minimum of distortion. Stiffness is also helpful in preventing sagging of open steam-cured, extruded strip and in reducing the percentage of rejects in some complicated molded item. The handling qualities of Neoprene Type GN stocks can often be improved in this respect by substituting a portion of Neoprene Type CG for some of the Type GN in the compound. Data covering the properties of blends of Type CG and Type GN both before and after vulcanization are discussed in a recent report entitled "Neoprene Type GN-CG Blends."*

RUBBER CHEMICALS DIVISION

Wilmington DUPONT *Delaware*

THE RUBBER AGE, published monthly by The Palmerton Publishing Co., Inc., Printing Office, East Stroudsburg, Pa. Editorial and Advertising Offices at 250 West 57th Street, New York, N. Y. Entered as second class matter October 20, 1933, at the Post Office at East Stroudsburg, Pa., under the Act of March 3, 1879. Subscription in United States, $3.00 a year. Canada, $3.50; Foreign, $4.00. June, 1942. Vol. 51, No. 3.

There's a challenge in that sign

As producers of Hycar, the All-American synthetic rubber, we believe signs like that above are a challenge—a challenge to our ability to develop and perfect superior synthetic rubbers for every useful purpose.

For the sign says, in effect, that brakes today are not to be trusted to hold back a heavy truck on hills; that they might overheat, fail and cause an accident.

But what if a brake and clutch lining material were available that could take, say, a 100 degree higher temperature and then disperse it faster than the best rubber compounds now in use?

What if it also were immune to the dangerous effects of oil and grease; soft enough for smooth, velvet braking action, yet hard enough to stand great pressures and still not damage brake drums?

Today our time, our energies and vastly expanded plant are devoted to development and application of the special Hycar products needed by our war industries; Hycar products that resist oil and gasoline, abrasion, heat, aging and compression-set; Hycar products that make the finest tanks and hose, gaskets, seals, diaphragms and packing . . . and, for essential war uses, these very brake-linings.

Tomorrow all this extra experience and special knowledge that we have gained today, will go into greatly improved products and methods — brake linings included — that will bring a higher degree of comfort, convenience and safety into the lives of all Americans.

HYCAR *Synthetic Rubber*

HYCAR CHEMICAL COMPANY · *Akron, Ohio*

OUR ARMED FORCES ROLL ON RUBBER

KEEP YOUR PRODUCTION *Rolling*

with CLIMCO PROCESSED LINERS

★ Climco Processing, a tough, flexible glaze applied to the liner, helps speed production by eliminating expensive delays resulting from imperfect separation. Because it prevents stock adhesions, no time is wasted cutting out and repairing bad spots. Because compounds will not adhere to the liner, no time is consumed in brushing and cleaning. ★ Furthermore, now that fabrics are higher in price and more difficult to obtain, Climco Processing renders valuable service by greatly lengthening the life of the fabric. ★ If your liners are not already Climco Processed, write us about your operations, so that we can tell you in detail just how Climco Processing will save you time as well as money.

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INTERLEAVING PAPER
Treatment Contains
NO OIL OR WAX
Samples on Request

THE CLEVELAND LINER & MFG. CO.
Cleveland, Ohio

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For Faster, Better Production at Lower Cost

KALVAN

A WHITE PIGMENT

★

ONE HUNDRED PER CENT INCREASED PRODUCTION NOW AVAILABLE

★

Heavy loading, like soft blacks, permits a good saving of rubber and reclaim

★

ALSO KALVAN "S"

especially for use in synthetics

★

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Photo By U. S. Army Signal Corps.

GASTEX Helps Wire Jackets Handle Tough Assignments

Wire jackets used for portable telephone, telegraph, radio, and electric current service in the field by our Army Signal Corps must stand up under harsh treatment when wires are hauled around trees, rocks, and sharp corners and dragged through oil and grease, arch enemies of rubber.

Most compounders prefer GASTEX or PELLETEX as re-enforcing agents for wire designed for such rough use because these popular, special process blacks have been proved superior in resisting abrasion and the action of solvents. Splendid aging properties, moreover, enable GASTEX and PELLETEX Compounds to resist ozone and therefore outlast other compounds without cracking. Easy processing is another factor contributing to the popularity of GASTEX and PELLETEX for insulated wire.

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Plant and Laboratory: Wilmington, Delaware

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Tensile strength

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Dielectric strength

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A Timely Contribution to the War Effort

The Improved BLACK ROCK

DEBEADER SLITTER and PULLER

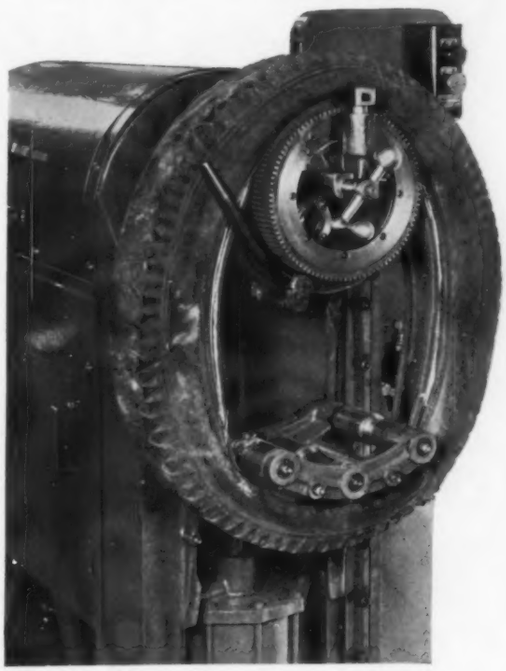

Fig. 1—Slitter with tire in position and under tension for cutting.

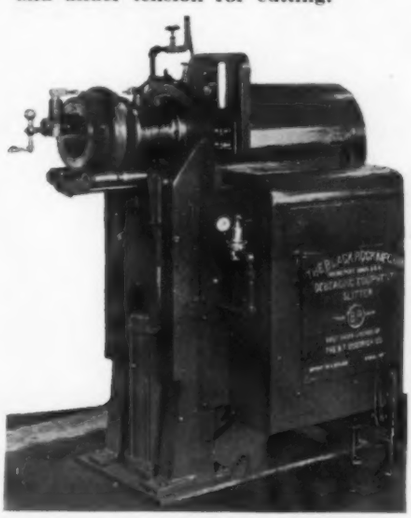

Fig. 2—Slitter in non-operating position ready to receive tire.

Here's What It Does---

Slits tires and removes bead wire from 3 to 4 tires per minute at a great saving of labor and time. Reduces waste in tire reclaim to less than 6% as compared to 17 to 20% under present methods, saving over 30,000,000 pounds of tire scrap annually. Makes bead wire suitable for sale as steel scrap at a good price. Value demonstrated by long use in B. F. Goodrich Co. plant.

The equipment is operated by a combination of compressed air and electric motors and operating cycle is automatic after starting in operation. Position of knives and depth of cut easily regulated to handle different sizes and types of tires.

"Black Rock Debeader, Licensed by the B. F. Goodrich Company under C. W. Leguillon Patent No. 2,230,302."

Fig. 3—Puller removing bead wire from tire—another hook in rear provides for dual operation.

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175 OSBORNE ST., BRIDGEPORT, CONN.

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TRADE FINE BR TOOLS MARK

PACIFIC COAST REPRESENTATIVES
Lombard Smith Co.
2032 Santa Fe Ave., Los Angeles, Cal.

Dear Pop:

Even an old Rainbow Divisioner like you would pop your eyes at the army we're putting together this time. Let me tell you, they're doing everything to make up just about the best bunch of fighting galoots you ever saw.

And that goes for what they do for us off duty, too! Take this new clubhouse we got just outside of camp. It's got radios, dance floors, nice soft chairs and everything. And, Pop, you can get something to eat that won't cost you a month's pay!

Now, the army isn't running this. The USO is. And most of the other camps got USO clubs too, because you and a lot of other folks dug down and gave the money to the USO last year.

But, Pop, you know what's happened since then. Guys've been streaming into uniform. Last year there was less than 2 million of us. This year there'll be 4 million. And the USO needs a lot more dough to serve that many men—around 32,000,000 bucks I hear.

Now, Pop, I know you upped with what you could last time. But it would sure be swell if you could dig into the old sock again. Maybe you could get some of the other folks in the neighborhood steamed up, too.

It will mean an awful lot to the fellows in camp all over the country. Sort of show 'em the homefolks are backing them up. And, Pop, an old soldier like you knows that's a mighty nice feeling for a fellow to have. See what you can do, huh, Pop?

Bill

GIVE TO THE

USO

Send your contribution to your local USO Committee or to National Headquarters, USO, Empire State Building, New York, N. Y.

Space Contributed by THE RUBBER AGE.

—but where will he "gas up" tomorrow?

MAYBE Russia . . . maybe India . . . no one knows.

American airplanes go wherever they are needed. And when they get there, they are ready to fly into the fight using Russian gas, Indian gas, or the gas of any other country.

This ability of our planes to perform at top efficiency on every aviation fuel is a tribute to the rubber industry which supplies the fuel lines through which giant airplane engines are fed.

To us it means much because Thiokol* synthetic rubber made possible the first fuel lines that withstood every aviation fuel, including the aromatic blends. Many years ago in cooperation with our research department, rubber chemists established that gasolines containing benzol, xylol and toluol have no effect on Thiokol synthetic rubber. Superior fuel lines followed shortly.

Airplane fuel lines and airplane refueling hose are two of the many products in which Thiokol synthetic rubber is being used. On tanks, planes and ships this remarkably solvent-resisting material is now vital to efficient performance. Supplying every possible pound of Thiokol synthetic rubber for victory is the first—and only—job that Thiokol Corporation can think about now.

Thiokol

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SYNTHETIC RUBBER

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YOU GET A BETTER LOOKING PRODUCT AND MORE CURES PER MOLD CLEANING

Equal parts of Para Lube and SL-20 is a C. P. Hall development that does the job of fatty acids ***better*** and ***more economically.***

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Manufactured under rigid quality control, you can specify PICCO Products with absolute assurance of complete satisfaction.

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XX-100	for high durometer stocks
420-S	for light colored, intermediate hardness stocks
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Please refer inquiries to Standard Chemical Co., Akron Savings and Loan Bldg., Akron, Ohio, sole representatives to the rubber industry.

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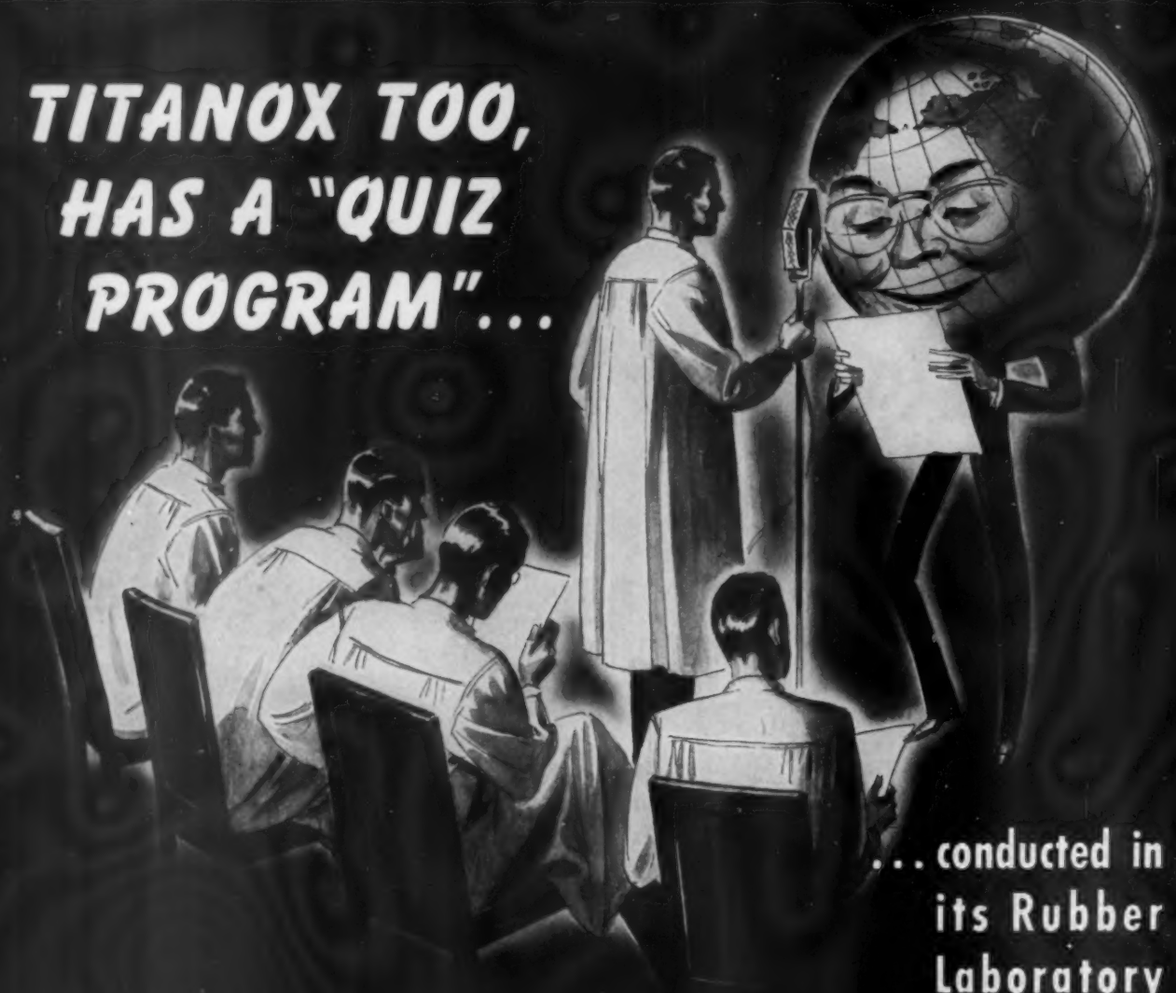
TITANOX TOO, HAS A "QUIZ PROGRAM"...



... conducted in its Rubber Laboratory

CONFRONTED by the shortage of crude rubber, the more extensive use of reclaimed rubber, the search for substitutes for materials no longer procurable, and new conditions created by government specifications for new products, the lot of the manufacturer of white and light-colored rubber products certainly is not a happy one. The white rubber world wants answers to the resulting questions which arise.

It is with pleasure that the makers of TITANOX pigments offer in this emergency the assistance of their rubber laboratory staff and equipment in helping to solve technical problems involving the use of these pigments.

Through knowledge of titanium pigments and their use in rubber compounding, our technical staff has been able to smooth the road for many of our customers. We will gladly help *you* to get the full benefit from your TITANOX pigments.

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TITANOX

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TITANOX

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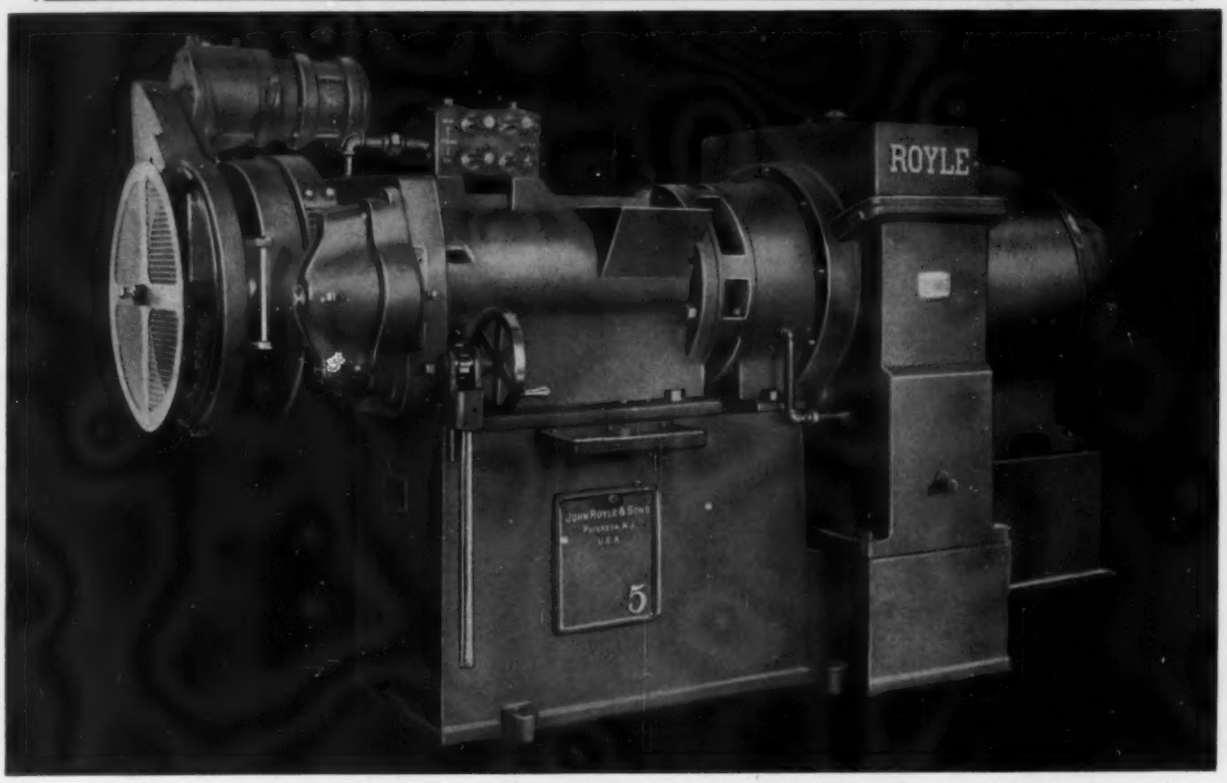
TIMES *have* CHANGED



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Manufacturers find in the X-1-A Unit a reliable means of evaluating substitute materials, testing new formulas, checking established products and adapting their products to the requirements of the consumers. An increasing number of large consumers are specifying performance in terms of tests made in the "National" Accelerated Weathering Unit.

Be Prepared TO GUARANTEE YOUR PRODUCTS ON THE BASIS OF THIS TRUE STANDARD OF COMPARISON

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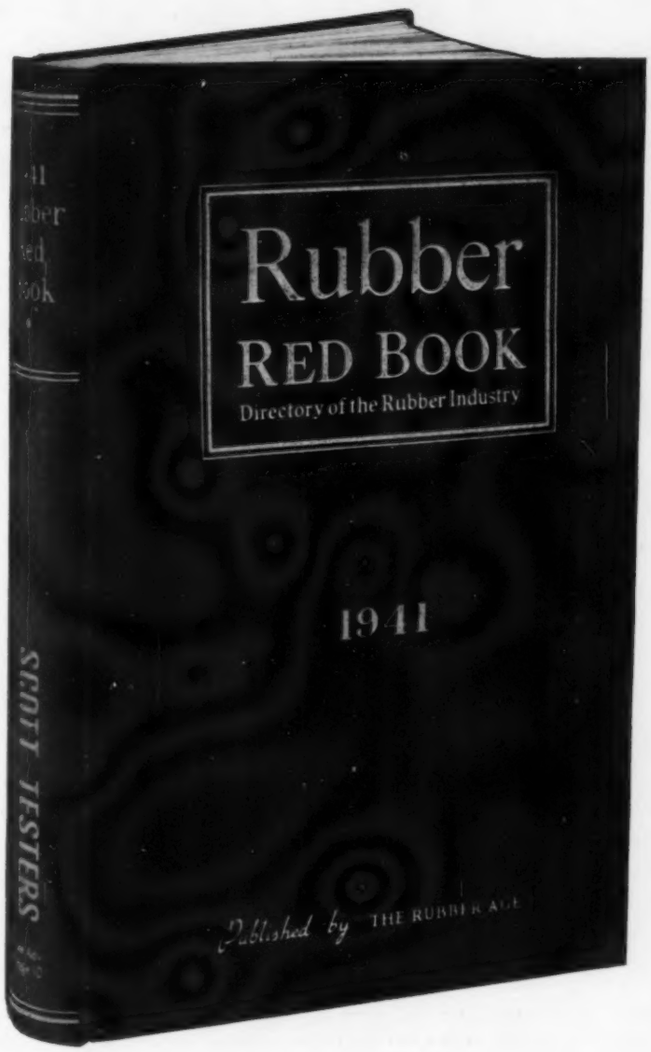
Washington Finds It Indispensable —*So Will You!*



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The Enlarged 1941 Rubber Red Book

Completely revised with all data brought strictly up-to-date

Several new sections added based on the needs of the industry and at the suggestions of users

Fully indexed for easy reference, making the location of any material a simple matter

New cover of latex-bonded fibre with leather finish which will withstand constant handling

Contains information and data not available elsewhere (see Table of Contents on reverse side)

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Published by

THE RUBBER AGE
250 West 57th Street
New York, N. Y.

The INDISPENSABLE REFERENCE BOOK for Rubber Manufacturers, Suppliers, etc....

To rubber factory executives, purchasing agents, technologists, etc., the RUBBER RED BOOK furnishes complete and handy lists of suppliers of all kinds of materials, equipment and services classified for easy reference. This is a service which saves buyers much time and effort as in no other directory are such lists available.

Suppliers and their salesmen, on the other hand, find the RUBBER RED BOOK invaluable for its complete and accurate listing of rubber manufacturers in the United States and Canada with such data as size of company, type of products made, names of buyers and other executives, etc. Also included is a geographical breakdown of rubber manufacturers in the United States showing all companies in each city and town. This feature enables salesmen to be certain that no prospect is overlooked.

No matter what position you hold in the rubber industry—factory executive, purchasing agent, chemist, technologist; supplier of machinery, chemicals, rubber, or other materials; librarian; consultant; salesman or user of rubber products—you should have a personal copy of the 1941 RUBBER RED BOOK on your desk or in your brief case ready to give an immediate answer to the thousand and one questions which crop up constantly, particularly during these critical days when accurate information is so essential.

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RUBBER MANUFACTURERS IN THE UNITED STATES
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ACCESSORIES AND FITTINGS
Classified Lists of Products; Suppliers and Addresses

RUBBER CHEMICALS AND COMPOUNDING MATERIALS
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FABRICS AND TEXTILES
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RUBBER DERIVATIVES

RUBBER LATEX
Latex and Latex Compounds; Water Dispersions; Special Latex Processes; Latex Compounding Materials; Latex Machinery and Equipment

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MANUFACTURER'S SALES AGENTS, BRANCH OFFICES, ETC.
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TRADE AND TECHNICAL ORGANIZATIONS

WHO'S WHO IN THE RUBBER INDUSTRY

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USE ATTACHED CONVENIENT ORDER FORM

..... 19.....

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250 West 57th St., New York

Kindly send ..... copies of the 1941 RUBBER RED BOOK at $..... each to the undersigned:

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Here's a new Continental Black that fills an urgent need!

Continental "AA" is specially processed to *offset* the extra heat generating properties of reclaim in heavy-duty tires. Contributing less to heat generation than do standard channel blacks, Continental "AA" maintains the correct balance between this property and wear resistance . . . provides a timely aid to top performance in military, bus, and truck tires formulated partially with reclaim. Thorough testing in actual reclaim formulations offers convincing proof of the low heat generating characteristics of Continental "AA".

It's easier processing, too—definitely superior in this respect to the grades customarily used in passenger car tires.

Continental's production set-up assures adequate supplies of this new black—and rigid laboratory control methods maintain the same high quality that characterizes all other grades of Continental Blacks.

Write for samples today—see for yourself how completely Continental "AA" meets your requirements.

RIGHT IN TIME FOR YOUR BUNA S WORK, TOO!

Now, while you're experimenting with this type synthetic rubber, we suggest that you investigate the characteristics of Continental "AA" in your Buna S formulations. We'll be glad to send you samples for this purpose, too.

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INDUSTRY ANSWERS THE CALL!

A WAR MESSAGE
to
ALL EMPLOYERS
★ From the United States Treasury Department ★
WHAT THE PAY-ROLL SAVINGS PLAN DOES
A PAY-ROLL SAVINGS PLAN
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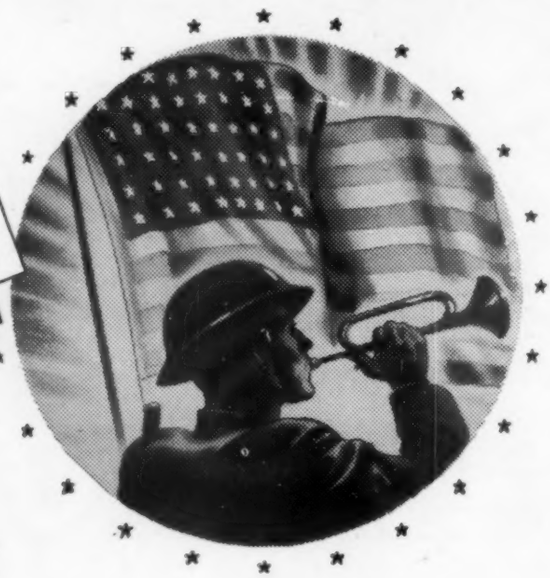
32,145 Firms With Over 17,700,000 Employees Have Installed the . . .

PAY-ROLL SAVINGS PLAN



Have YOU Started the Pay-Roll Savings Plan in YOUR Company?

Like a strong, healthy wind, the Pay-Roll Savings Plan is sweeping America! Already more than 32,000 firms, large and small, have adopted the Plan, with a total of over seventeen million employees—and the number is swelling hourly.

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POSITION .....

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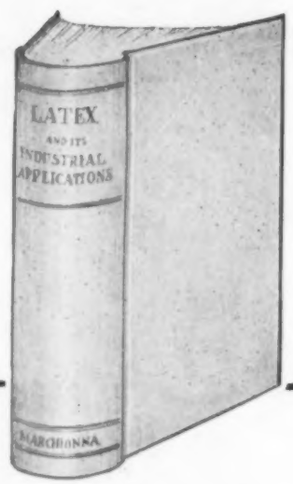

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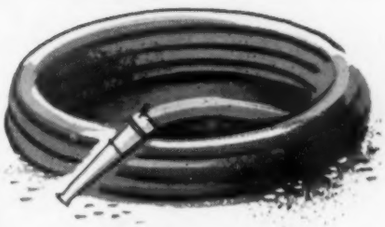

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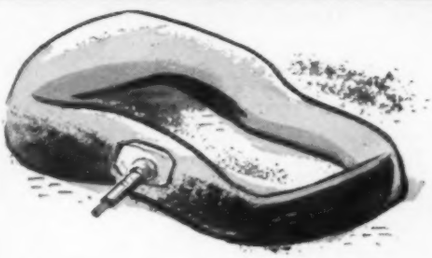

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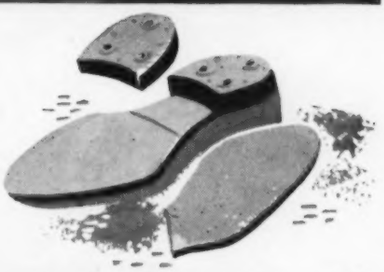

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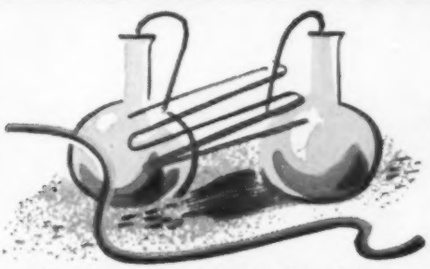

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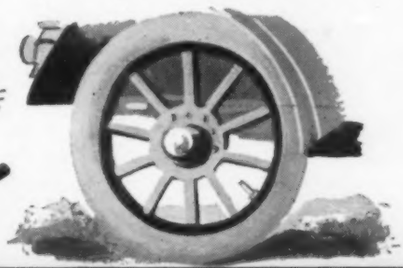

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The RUBBER AGE

VOL. 51, No. 3 JUNE, 1942

Sunlight and Accelerated Light Aging of Synthetic Rubbers

By ROSS E. MORRIS[1], ROBERT R. JAMES[2], and T. A. WERKENTHIN[3]

RECENTLY Werkenthin and co-workers[4] reported on the sunlight and accelerated light aging of various natural and synthetic rubber stocks and proposed a method for standardizing the accelerated light aging test. The purpose of the present paper is to provide data on the correlation of sunlight aging with accelerated light aging for various synthetic rubber stocks loaded with mineral pigments.

Formulas and Cures

The formulas and cures for the synthetic rubber stocks are given in Table I. These stocks have a loading corresponding to a good quality, 40% wire insulation compound. It will be noted that most of the prominent types of synthetic rubber manufactured in this country and one foreign synthetic rubber were included in this study. It was necessary to blend the Vistanex Medium with natural rubber, inasmuch as this synthetic rubber cannot be vulcanized.

The stocks were mixed and cured following the methods recommended by the A.S.T.M. The cure giving the optimum tensile was selected for light aging.

Procedure for Light Aging

The procedure employed for determining the accelerated light aging of the stocks was essentially that described by Werkenthin *(loc. cit.)*. The specimens, cut from ordinary test slabs, were 2 inches x 6 inches x 0.08 inches. The specimens were held at 20% elongation by stretching racks during exposure to the carbon arc in the National Eveready Model X-1A Irradiating Unit. The stretching racks were supported only on the upper part of the revolving frame in the irradiating unit.

Exposures were made to arcs from two types of carbons—the Eveready "Sunshine" carbon and the Eveready "U" carbon. No filters were used. Both exposures were continued until the more vulnerable stocks showed severe cracking, and it was judged that further exposure would deteriorate the specimens to such an extent that accurate determination of physical

Note: The opinions or assertions contained herein are the private ones of the authors and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

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[3] Materials Engineer, Navy Department, Washington, D. C.

[4] Werkenthin, Richardson, Thornley and Morris, *Rubber Age (N.Y.)*, November and December, 1941, and *India Rubber World*, November and December, 1941.

TABLE I

	Vistanex M	Neoprene Type GN	Neoprene Type I	Thiokol Type F	Thiokol Type FA	Thiokol Type RD	Hycar O.R.	Chemigum Type I	Stanco Perbunan	German Perbunan
Vistanex M	50.0	...	...	....	....	...	...	...	...	...
Smoked Sheet	50.0	...	...	....	....	...	...	...	...	...
Neoprene Type GN	...	100.0	...	....	....	...	...	...	...	...
Neoprene Type I	...	...	100.0	....	....	...	...	...	...	...
Thiokol Type F	...	...	...	100.0	....	...	...	...	...	...
Thiokol Type FA	...	...	...	....	100.0	...	...	...	...	...
Thiokol Type RD	...	...	...	....	....	100.0	...	...	...	...
Hycar O.R.	...	...	...	....	....	...	100.0	...	...	...
Chemigum Type I	...	...	...	....	....	...	...	100.0	...	...
Stanco Perbunan	...	...	...	....	....	...	...	...	100.0	...
German Perbunan	...	...	...	....	....	...	...	...	...	100.0
Lithopone	105.0	76.0	70.0	112.0	112.0	77.4	75.4	75.4	75.4	75.4
Zinc Oxide	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Litharge	...	15.0	20.0	....	....	...	...	...	...	...
Stearic Acid	.5	.5	1.0	.5	.5	1.0	1.0	1.0	1.0	1.0
Paraffin	2.0	2.0	2.0	....	....	2.0	2.0	2.0	2.0	2.0
Barrett #10 Oil	...	5.0	15.0	....	....	...	...	...	...	...
Neophax A	...	10.0	...	....	....	...	...	...	...	...
Dibutyl Phthalate	...	...	...	....	....	15.0	15.0	15.0	15.0	15.0
Tricresyl Phosphate	...	...	...	....	....	15.0	15.0	15.0	15.0	15.0
Latac	...	.5	...	....	....	...	...	...	...	...
Neozone A	...	2.0	2.0	....	....	...	...	...	...	...
Age Rite Resin D	1.5	...	...	....	....	...	1.5	1.5	1.5	1.5
Age Rite White	.5	...	...	....	....	...	.5	.5	.5	.5
Altax	...	2.0	2.0	.45	.45	...	...	...	...	...
D.P.G.	...	...	...	.1	.1	...	...	...	...	...
Santocure	.45	...	...	....	....	1.0	1.0	1.0	1.0	1.0
El Sixty	.6	...	...	....	....	.1	.1	.1	.1	.1
Sulfur	1.15	...	1.0	....	....	1.5	1.5	1.5	1.5	1.5

properties would not be possible. The exposure times were 56 hours to the "Sunshine" carbon arc and 24 hours to the "U" carbon arc.

The above exposure times line up fairly well with the relative intensities of the ultra-violet light emitted by the arcs, as would be expected. Unpublished data obtained from the National Carbon Company show that the intensity of ultra-violet light in the range 2300-3300 Angstrom Units is approximately 3.4 times greater for the "U" carbon arc than for the "Sunshine" carbon arc.

Specimens similar to those described above were exposed to direct sunlight for three months, September 23, 1941 to December 23, 1941, on the roof of the Rubber Laboratory at the Navy Yard, Mare Island. These specimens, maintained at 20% elongation, were supported on a frame at an angle of 45 degrees with the horizontal and faced south during exposure. Since exposure to sunlight did not cause severe cracking on any of the specimens, the period of exposure was set at three months for convenience.

Results of Exposures

It is customary in papers on the light aging of rubber to include numerous photographs of exposed specimens. Usually these photographs have been reduced to a convenient size for printing so that none but the grossest details may be seen by the reader. Since there is no point in publishing photographs which are not clear to the reader, the authors have decided to deviate from the usual procedure by eliminating photographs in favor of a table (Table II) describing the surface appearance of the exposed specimens.

In order to make the descriptive data in the table understandable, it is necessary that the terms, crazing and cracking, be carefully defined. The authors define these terms as follows:

Crazing:—A network of very fine, irregular cracks in a resinous layer on the surface of the rubber. The cracks may run in any direction on the surface. The depth of the cracks is limited by the thickness of the resinous layer. The apparent thickness of the resinous layer is used as a measure of the degree of crazing.

Cracking:—A condition where cracks penetrate through the surface into the body of the rubber. The cracks may differ considerably in number, length and depth depending upon the severity of the light action and the innate characteristics of the stock. All of the cracks run in a direction approximately normal to the direction of stretch.

Table II shows that all of the stocks were relatively unaffected by sunlight when judged by surface appearance. Although several of the stocks exhibited crazing, this form of deterioration is not considered to be as serious as cracking from the standpoint of service requirements. Exposure to the carbon arc affected the surfaces more than sunlight in the cases of the Perbunan-type stocks* and the Thiokol Type RD stock, but about the same as sunlight in the cases of the Vistanex Medium stock, the neoprene stocks and the other Thiokol stocks.

Better correlation between sunlight aging and carbon arc aging was obtained when the extent of deterioration was based on change in tensile properties instead of on change in surface appearance. The

* Hycar O.R., Chemigum Type I, Standard Perbunan, and German Perbunan are grouped as Perbunan-type stocks.

TABLE II—EFFECT OF LIGHT AGING ON SURFACE APPEARANCE

Type of Rubber	Exposed to "U" Carbon Arc		Exposed to "Sunshine" Carbon Arc		Exposed to Direct Sunlight	
	Exposed Side	Back Side	Exposed Side	Back Side	Exposed Side	Back Side
50% Vistanex M 50% Smoked Sheet	Slight cracking	No change	No change	No change	Crazing	Very slight crazing
Neoprene Type GN	No change	No change	No change	No change	Crazing	No change
Neoprene Type I	No change	No change	No change	No change	Very slight crazing	No change
Thiokol Type F	No change	No change	No change	No change	No change	No change
Thiokol Type FA	No change	No change	No change	No change	No change	No change
Thiokol Type RD	Cracking	No change	Very slight cracking	Slight cracking	Crazing	No change
Hycar O.R.	Slight cracking	No change	Cracking	Severe cracking	Very slight cracking	No change
Chemigum Type I	Slight cracking	Cracking	Very slight cracking	Cracking	No change	No change
Stanco Perbunan	Slight cracking	Cracking	Very slight cracking	Cracking	Very slight cracking	No change
German Perbunan	———	———	Cracking	Severe cracking	No change	No change

initial and aged tensile strengths are charted in Figure 1, and the initial and aged ultimate elongations are charted in Figure 2.

It will be observed that the three aged values for the tensile properties of each stock are in fair agreement with one another. In other words, 24 hours exposure to the "U" carbon arc or 56 hours exposure to the "Sunshine" carbon arc produces deterioration in tensile properties closely equivalent to three months exposure to winter sunlight. Both accelerated light aging procedures agree with the sunlight aging procedure in establishing the Vistanex stock, both neoprene stocks, the Thiokol Type F and the Thiokol Type FA stock as having superior light resistance over the Thiokol Type RD stock and the Perbunan-type stocks.

It can be argued that the close agreement between the change in physical properties caused by the accelerated light aging procedures and the change in physical properties caused by the sunlight aging procedure was fortuitious inasmuch as the sunlight aging of the specimens was arbitrarily discontinued at the end of three months. Be that as it may, at least a directional agreement would be expected if the radiations from the carbon arcs have an effect on the stocks compar-

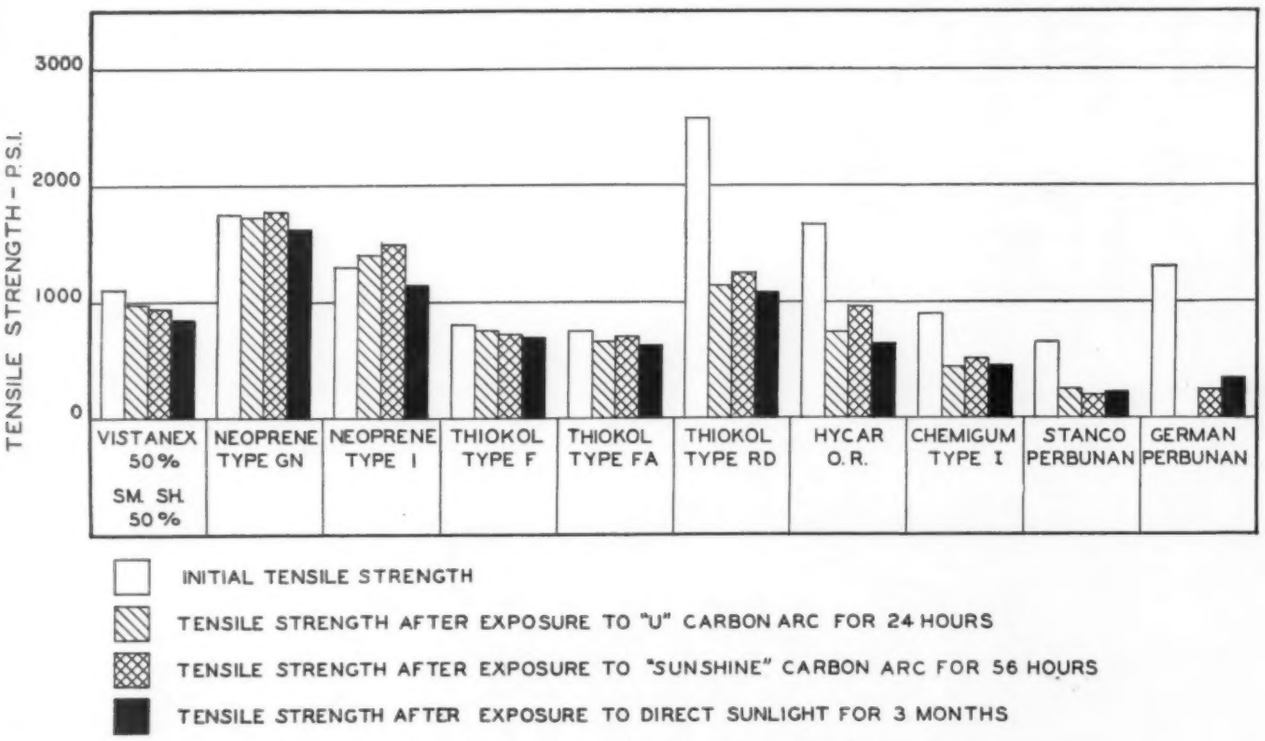


Fig. 1—Effect of Light Aging on Tensile Strength of Synthetic Rubber Stocks.

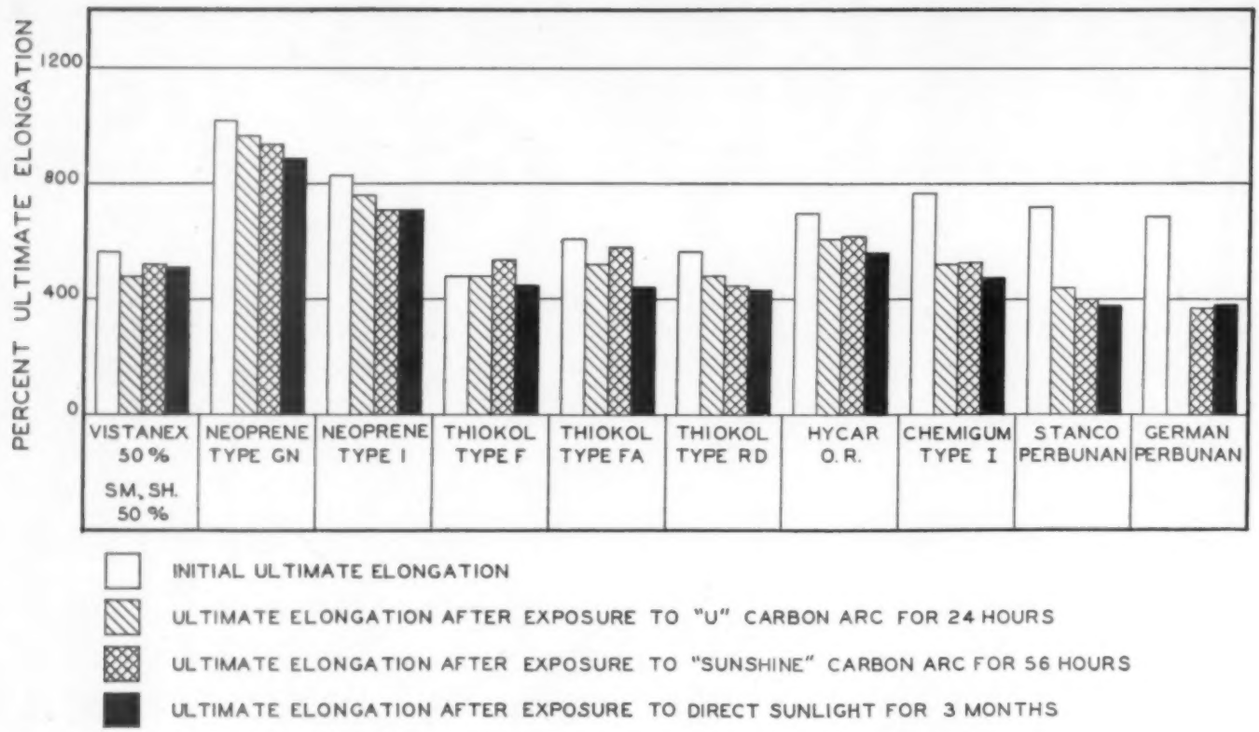


Fig. 2--Effect of Light Aging on Ultimate Elongation of Synthetic Rubber Stocks.

able to sunlight. Except in the case of the Neoprene Type I stock, this directional agreement was found for all stocks.

The pronounced deterioration in tensile strength of the perbunan-type stocks due to sunlight aging could not have been foretold by visual examinations of the exposed specimens since none showed severe cracking. This conclusion provides further confirmation for the statement by Werkenthin *(loc. cit.)* that visual examination alone cannot be relied upon to determine the extent of deterioration produced in vulcanized rubber by light.

ACKNOWLEDGMENT

The authors wish to acknowledge the cooperation of Irwin H. Whitthorne in this investigation.

Piccocizer 30 — A New Plasticizer

A NEW plasticizer, known as Piccocizer 30, a high boiling polymerized aromatic oil that incorporates rapidly and serves as an incorporating vehicle for other materials in the compound, has been developed by the Standard Chemical Co., Akron, Ohio. Tests are said to have borne out substantial values in compound improvement, time saving, and cost reductions through the use of this new product.

Although the development of the new plasticizer was the direct result of a search for a polymerized oil that could be produced from an origin of unlimited availability, its properties for affecting the affinity of synthetics for other compounding materials and for providing low-temperature flexibility were largely accidental sequels in the steps of its development. Needs of war industries will not hamper the production of the plasticizer since its basic source is unlimited.

According to Standard Chemical, incorporating time has been reduced so materially in this new plasticizer that it solves many of the compounding problems which synthetic rubbers have brought to the mixing room. This saving in time is an important element in cost reduction as well as output expansion. With present tests showing flexibility at —30° F., Piccocizer 30 aids in the production of materials meeting most low-temperature specifications. Its action affecting the affinity of synthetics for other compounding materials is a vital aid in the use of pigments and fillers, thus reducing ultimate product cost.

The following data from tests conducted with Hycar O.R. is made available for general information:

Basic Formula

Hycar O.R.	100.0
Zinc Oxide	5.0
Channel Black	50.0
AgeRite Powder	1.0
Stearic Acid	1.0
Altax	1.5
Sulfur	1.5
Piccocizer 30	30.0

	20 Min. @ 310° F.	30 Min. @ 310° F.	45 Min. @ 310° F.
Modulus @ 300%	400	600	850
Tensile	2375	3000	2975
Elongation	670	690	600
Durometer Hardness	58	58	60
Schopper Rebound	..	37	..
Low Temp. Flexibility	..	—30	..
Time of Incorporation	..	7 min.	..
Delta Volume 48 Hrs. Hexane	..	—2.3%	..

Abstracts of United States Patents on the Compounding and Use of Synthetic Rubber

By FREDERICK MARCHIONNA, M. S. Chem.*

THE extension of the war to the Pacific and the unexpected success of the Japanese in that area has put the United States and the other United Nations in a precarious position insofar as rubber is concerned. Shipments of crude rubber from the now Japanese-occupied area amounted to 1,323,716 tons in 1940, most of which went to the United States and England. It is evident that we must turn to some other source for rubber if we are to win the war and it is equally evident that the most promising source is synthetic rubber. Accordingly, abstracts on the use of synthetic rubber taken from United States patents should prove beneficial to rubber chemists and compounders throughout the United Nations. Emphasis is placed on the *use* rather than the *manufacture* of these synthetics at this time because of the greater interest in such use.

The term "synthetic rubber" is subject to debate as to proper definition. Fisher *(Ind. Eng. Chem.,* Vol. 31, No. 8, pp. 941-45, August, 1939) groups all synthetic rubbers and rubber-like plastics under the general term of "elastomers" and then subdivides them into "elastroprenes," "elastoienes," "elastothiomers," and "elastoplastics." Wood ("Synthetic Rubbers: A Review of Their Compositions, Properties, and Uses," published by the National Bureau of Standards, Washington, D. C., as Circular C427 on June 25, 1940) lists 29 commercial varieties of synthetic rubber classified as follows: chloroprene polymers (neoprenes), butadiene polymers and co-polymers (bunas), organic polysulfides (Thiokol), isobutene polymers (Vistanex), plasticized vinyl chloride polymers (Koroseal), and dimethyl butadiene polymers ("methyl" rubber).

Since the first three types listed by Wood, *i. e.,* chloroprene polymers, butadiene polymers and copolymers, and organic polysulfides, embrace the more widely used synthetic rubbers the abstracts to follow will be restricted to such types. By far the kinds of commercially available synthetic rubbers fall into the second classification. These include the various bunas produced in both Germany and the United States, the Hycar made by the Hycar Chemical Co., the Chemigum manufactured by Goodyear, and the Butyl Rubber now being produced by the Standard Oil Co. of Louisiana.

The abstracts which follow in this and subsequent issues cover practically all of the United States patents on the compounding of the three types of synthetic rubber mentioned, their latex production, and various uses to which these rubbers have already been adapted.

* Mr. Marchionna is the author of "Latex and Rubber Derivatives and Their Industrial Applications," the most complete bibliography on the subject, consisting of abstracts of patents and the literature. A graduate chemist, formerly associated with one of the leading rubber manufacturers, he has been connected with the U. S. Patent Office, now located in Richmond, Virginia, for many years.

Hofmann et al—U. S. Pat. 1,081,613—December 16, 1913. *Vulcanized Dimethyl Butadiene.* (Assigned to Bayer & Co., Germany).

The polymerized dimethyl butadiene described by Kondakow (*J. Prakt. Chem.,* 64-110, 1901) is mixed with sulfur and the mixture heated to obtain a vulcanized synthetic rubber of good qualities which can be used to make any desired rubber articles. Preferably, the white autopolymerized dimethyl butadiene rubber is treated, as by maceration, with dilute aniline water, thus producing an additional quantity of dimethyl butadiene rubber in the presence of aniline water. About 20 parts of this rubber are mixed with 2 parts of sulfur and the combination heated at 135° C. for one hour to obtain the elastic product.

Hofmann et al—U. S. Pat. 1,084,334—January 13, 1914. *Vulcanized Butadiene Rubber.* (Assigned to Bayer & Co., Germany).

Polymerized butadiene is vulcanized with sulfur to obtain a vulcanized rubber in the form of a grayish non-adhesive mass which forms ozonides, and on decomposition of the ozonides with water forms succinic and levulinic aldehydes, similar to natural rubber under the same conditions. In one example, a 20% benzene solution of polybutadiene is treated with a 2% solution of S_2Cl_2 in CS_2, and the vulcanized solution poured into ethyl alcohol after about two minutes standing to obtain a coagulated vulcanized tough rubber which is non-tacky. In another example, the same butadiene rubber is mixed with 10 to 30% of powdered sulfur and is sheeted and cured at 150° to 160° C. from 3 to 6 hours to obtain a semi-hard synthetic rubber.

Hofmann et al—U. S. Pat. 1,084,335—January 13, 1914. *Vulcanized Dimethyl Butadiene Rubber.* (Assigned to Bayer & Co., Germany).

The same vulcanization methods described in U.S. Pat. 1,084,334 are carried out with a dimethyl butadiene rubber to obtain vulcanizates equal to if not better than similar vulcanizates from crude natural rubber.

Hofmann et al—U. S. Pat. 1,084,336—January 13, 1914. *Vulcanized Alkyl Butadiene Rubber.* (Assigned to Bayer & Co., Germany).

A non-adhesive, elastic, rubber-like material is obtained by mixing 10% (more or less) of flowers of sulfur with a polymerized butadiene rubber in which one of the hydrogens is replaced with an alkyl radical having more than one carbon atom—specifically, 2 ethyl butadiene 1.3-, and heating the mixture for one to two hours with steam under a pressure

of 3 to 4 atmospheres. A quantity of natural rubber can be mixed with the synthetic polybutadiene and sulfur and the mixture vulcanized as above.

Hofmann et al—U. S. Pat. 1,084,337—January 13, 1914. *Vulcanized Methyl Butadiene Rubber.* (Assigned to Bayer & Co., Germany).

The vulcanization methods described in U.S. Pat. 1,084,334 are carried out with a synthetic rubber-like mass obtained by the polymerization of alpha methyl butadiene to obtain the same grayish, vulcanized elastic product, which yields an ozonide decomposing into the 2-methyl derivative of succinic aldehyde. A quantity of natural rubber can be incorporated in the synthetic rubber to be vulcanized.

Hofmann et al—U. S. Pat. 1,084,338—January 13, 1914. *Vulcanized Butadiene Co-polymers.* (Assigned to Bayer & Co., Germany).

A mixture of isoprene and dimethyl butadiene, in the form of co-polymers, are vulcanized with sulfur chloride or powdered sulfur, as described in U. S. Pat. 1,084,334.

Hofmann et al—U. S. Pat. 1,130,903—March 9, 1915. *Hard and Soft Synthetic Rubber.* (Assigned to Synthetic Patents Co., Inc., New York, N. Y.).

In a method for producing vulcanized butadiene rubbers, the auto-polymerized butadiene is admixed with a small quantity of a methylene base, *e.g.,* piperidine, thio-piperidine, methylamines, etc., and sulfur and then vulcanized into soft or hard products. In one example, a poly-dimethyl butadiene is admixed with 0.75% piperidine and 25% sulfur and heated for two hours at 160° to 165° C. to obtain a good hard rubber-like product. By using a smaller quantity of sulfur and heating the mixture at a lower temperature for a shorter time, there is obtained a soft vulcanized synthetic rubber. The quantity of sulfur in the foregoing example is 10% and the mixture is heated at 120° to 125° C. for one hour or at 135° to 145° C. for 15 minutes. In another example, 40 to 50% of sulfur is mixed with the dimethyl butadiene rubber, together with 1.5% of piperidyl dithiocarbamate or the reaction of hydropyrrole with CS_2, and heated at 155° C. for 2 to 4 hours to produce hard rubber.

Gottlob—U. S. Pat. 1,149,577—August 10, 1915. *Polybutadiene Latex.* (Assigned to Bayer & Co., Germany).

A rubber-like product in the form of latex resembling natural latex is obtained by incorporating egg albumen, starch, gelatine, etc., in the form of aqueous solutions in a butadiene compound so as to disperse the butadiene in the colloidal aqueous solution, and then causing the hydrocarbon to polymerize, thereby obtaining polymerized butadiene dispersed in the aqueous medium, resembling natural latex, which can be used as such or coagulated. In the example, egg albumen (7) is dissolved in water (500) and isoprene (300) added. The mixture is heated in an autoclave at 60° C. for several weeks while stirring continuously, thereby obtaining a latex containing dispersed polymerized isoprene. An alkali may also be added to the mixture before polymerization.

Glidden—U. S. Pat. 1,171,187—February 8, 1916. *Rubber Substitute.* (Assigned to Hood Rubber Co., Watertown, Mass.).

An elastic rubber substitute is produced by heating waste vulcanized rubber with butadiene and a small quantity of a higher fatty acid, whereby the butadiene polymerizes with the waste vulcanized rubber to produce an elastic mass of synthetic butadiene rubber and vulcanized natural rubber. In the example given, 30 lbs. of ground vulcanized rubber from tire tubes are mixed with 100 lbs. of dimethyl butadiene and one lb. of stearic acid, and the mixture heated in an autoclave at 100° C. for two to three weeks, thereby obtaining an elastic mass which is washed with water in a washing machine, and then treated with superheated steam to remove any dimer. On drying and vulcanizing this product there is obtained a transparent, elastic rubber.

Danier—U. S. Pat. 1,656,694—January 17, 1928. *Reclaiming Rubber.*

Natural rubber waste is reconditioned and reclaimed by first impregnating the waste rubber with isoprene obtained from the distillation of rubber, and treating the mixture with a polymerizing agent, such as HCl, so as to polymerize the isoprene and reclaim the waste rubber. Thus, waste from tire beads, gas or water pipes made of rubber are subjected to destructive distillation to recover isoprene therefrom. Strips of tire are saturated completely with this isoprene and immersed in concentrated or diluted HCl whereby the isoprene in the natural old rubber is polymerized while the natural rubber is not affected by the cold HCl. It requires from 15 to 20 days to effect complete polymerization of the isoprene in the natural rubber. The reacted mass, which is slightly viscous, is washed free of HCl with water and transferred to a washing drum to remove any waste textile fibre which has been decomposed by the acid.

Pratt—U. S. Pat. 1,671,314—May 29, 1928. *Polybutadiene Dispersions.* (Assigned to Dispersions Process, Inc., Dover, Delaware).

This patent deals with the production of aqueous dispersions of synthetic rubber from terpene, specifying isoprene as a terpene, so as to obtain an artificial latex in which the dispersed synthetic rubber particles would be similar to the particles of natural rubber in latex, namely, that each rubber particle is surrounded by a protective film of tanned protein. In the example given, a polyisoprene rubber produced in any convenient manner is worked in an internal mixer at about 130° F. to render the mass sticky, and water is slowly added until about 10 to 12% of water is absorbed by the sticky mass, forming a dispersion in which water constitutes the dispersed phase. A quantity of a protein, *e.g.,* vegetable albumen casein, etc., preferably wetted with water, is then incorporated in the pasty mass, together with a quantity of water added gradually, until there takes place a reversal of phase in which the polyisoprene particles, coated with a protein film, are dispersed in the aqueous medium, forming a non-tacky paste, which may be treated with a phenol, tannin, etc., to insolubilize the protein film on the rubber particles.

Dinsmore—U. S. Pat. 1,732,795—October 22, 1929. *Butadiene Polymer Dispersions.* (Assigned to Goodyear Tire & Rubber Co., Akron, Ohio).

Butadiene hydrocarbons are polymerized into rubber-like products by treating the butadiene with an emulsifying agent, such as soap, adding a small quantity of a protein, such as egg albumen, and heating at 50° to 70° C. to effect polymerization of the butadiene in dispersed form in water. In one example, isoprene (30 cc.) plus water (30 cc.) containing about 10 drops of oleic acid or other acids and ammonia or an alkali hydroxide are worked with 15 cc. of a 2% aqueous solution of casein and the resulting emulsion heated at about 50° C. for about two months to obtain a latex of synthetic isoprene rubber which can be coagulated with acetone, milled, and vulcanized like natural rubber. The same method can be carried out with dimethyl butadiene, using 15 cc. of a 2% aqueous solution of egg albumen instead of the casein and heating at 50° to 70° C. for about six months.

Boggs—U. S. Pat. 1,736,899—November 26, 1929. *Electrical Insulation.* (Assigned to Simplex Wire Co., Cambridge, Mass.).

Synthetic rubber from butadiene is an excellent material for the insulation of electrical conductors since it does not absorb water like natural rubber. A suitable insulating material is prepared by compounding a butadiene rubber (100) with zinc oxide (20) plus sulfur (16) plus paraffine wax (10) plus tetramethylthiuram disulfide (2) as accelerator. This insulating material is applied to conductor wires in any convenient manner and vulcanized at 265° F. for one-half hour.

Tocktermann et al—U. S. Pat. 1,814,420—July 14, 1931. *Stable Butadiene Polymers.* (Assigned to I. G. Farbenindustrie A. G., Germany).

A stable butadiene rubber is rendered resistant to aging by incorporating in the polymer an amine, aldehyde-amine, etc., preferably in the form of emulsion and in quantity from 0.5 to 2.0% of the butadiene polymer. In the example, five parts of the amine, such as aldol alpha-naphthylamine or acetaldehyde-aniline condensate, are emulsified in 100 parts of water and added to an aqueous emulsion containing isoprene (200), olein or stearic acid (18), 10% aqueous ammonia (17.5), water (340). The formed emulsion is allowed to polymerize and either used in latex form or coagulated so as to obtain a stable rubber-like product. The emulsion of the amine compound may be prepared by adding a hot alcoholic solution of the amine into the water or by stirring one part of the naphthylamine in 5 parts of ethyl lactate and 15 parts of water. Wetting agents, glue agar-agar, methyl or ethyl cellulose may be added as protective colloids.

Tschunkur et al—U. S. Pat. 1,826,846—October 13, 1931. *Vulcanized Synthetic Rubber.* (Assigned to I. G. Farbenindustrie A. G., Germany).

Vulcanizates from butadiene rubbers which may have an "index of strength" between 50,000 and 190,000 are obtained by the vulcanization of a mixture of at least two different polymers from the class consisting of butadiene, isoprene and dimethyl butadiene in the presence of finely divided carbon black. In one example, butadiene (75) and dimethyl butadiene (75) are emulsified in water (150) containing sodium stearate (15) and the emulsion is polymerized at 70° C. for one week. The resulting co-polymer is mixed with sulfur (3), zinc oxide (15), tar (2), stearic acid (2), D.P.G. (1) and carbon black (50) and cured at 135° to 140° C. for 40 to 50 minutes to obtain a rubber of high tensile strength. In another example, butadiene (100) is polymerized for three to four days in the presence of 0.2 to 0.4% of Na-wire in an atmosphere of N_2. About 30 parts of this polymer are dissolved in butadiene (100) diluted with ligroin or other solvents, emulsified as above, and heated at 50° C. for one week; then mixed as above with vulcanizing agents and 55% of soot, and vulcanized. The amount of carbon black, preferably soot, may be varied between 30 and 80% of the polymer.

Lewis and Weiss—U. S. Pat. 1,846,810—February 23, 1932. *Printing Elements.* (Assigned to Vulcan Proofing Co., Brooklyn, N. Y.).

An element for printing presses, such as drawsheet, blanket, packing, etc., which is resistant to oils and inks is obtained from a composition comprising a rubber-like plastic produced by reacting an alkylene dihalide, such as ethylene dichloride, with an alkali metal polysulfide. A suitable formula may comprise the polyethylene polysulfide reaction product (100), crude natural rubber (20), zinc oxide (10), carbon black (25), D.P.G. (0.5), mercaptobenzothiazole (0.2), sulfur (0.8), burgundy pitch (1), stearic acid (0.5), and paraffine wax (0.5). This composition is calendered onto a fabric base at about 200° F., dusted with talc, rolled on a drum with an interposed liner, and cured at about 270° to 280° F. in a steam vulcanizer for two hours or more, after which it is removed from the vulcanizer, allowed to cool gradually for 10 to 12 hours for the purpose of eliminating any porosity produced during curing, and then unwound from the drum. Cork granules may be incorporated in the mixture.

Patrick—U. S. Pat. 1,854,423—April 19, 1932. *Soft Rubber Mixtures.*

A plastic rubber composition which is resistant to oils comprises natural rubber compounded with a polyethylene polysulfide obtained by reacting an ethylene dihalide with an alkali polysulfide, these polysulfide plastics containing from 68 to 84.5% of sulfur. The hard polyethylene polysulfides have a sulfur content below 74% and a melting point between 100° and 120° C.; the soft polysulfides have a sulfur content between 74 to 84.5%, do not melt, and soften at about 140° C. In preparing the vulcanizable mixture the ingredients are worked by milling at about 80° C. In one example, a soft polyethylene polysulfide—83% sulfur—(39) is compounded with crepe rubber (39.8), zinc oxide (16), hard wood pitch (4), isopropyl xanthogenate tetrasulfide (0.4), and vulcanized at 277° F. for two hours, thereby obtaining a soft rubber vulcanizate containing no free sulfur. In another example, equal parts of rubber and soft polyethylene polysulfide are compounded with 0.5% of hexamethylene tetramine, with or without 16.5% of zinc oxide, calculated on the weight of the mixture, and cured at 276° F. for one and one-half hours. These vulcanizates do not bloom and have excellent elasticity. A mixture of natural and reclaimed rubber may be used.

Monookin—U. S. Pat. 1,854,480—April 19, 1932. *Polysulfide Plastic Compositions.*

Either the soft or the hard type of polyethylene polysulfides become gradually harder with age, the harder type becoming stiff and brittle. Tannic acid, starch, various oils, etc., accelerate the hardness of these polysulfide plastics. To prevent or retard such deteriorating effects, the polyethylene polysulfides are heated above 212° F. and preferably at 270° to 280° F. for one hour or more. In one example, a soft polysulfide—83% sulfur—(90) is admixed with sulfur by milling at about 175° F. and heated at 240° F. for two and one-half hours, thereby stabilizing the plastic material. In another example, the soft polysulfide plastic (70.4) is milled with zinc oxide (14.1), sulfur (7.8), aniline (0.7), hard wood pitch (7), and heated at 286° F. for one hour. In three other examples, there are used (a) 1% of each of cotton fibre and iron oxide; (b) 10% linseed oil; (c) 5% of litharge, the percentages being based on the weight of the polyethylene polysulfide mixture. These compositions are stabilized by heating (a) at 276° F. for one hour; (b) at 270° F. for two hours; and (c) 295° F. for one hour. These mixtures are highly resistant to oils and have excellent dielectric properties.

Luther et al—U. S. Pat. 1,864,078—June 21, 1932. *Synthetic Rubber Latex.* (Assigned to I. G. Farbenindustrie A. G., Germany).

Stable synthetic rubber latex is prepared by emulsifying butadiene in water in the presence of a sulfonated oil and then allowed to polymerize. In one example, isoprene (100) is emulsified with water (400), sodium or ammonium oleate (10), tertiary sodium phosphate (3), and secondary sodium phosphate (2), and the emulsion heated at 60° to 80° C. for three weeks in a pressure vessel to obtain a polyisoprene dispersed in water. In another example, isoprene (100) and butadiene (75) are emulsified in water (500) and Turkey red oil (15) or sodium naphthalene sulfonate (10) and tertiary sodium phosphate (15), and the resulting emulsion is polymerized at 80° to 90° C. for about two weeks to obtain a synthetic rubber latex which may be coagulated or used as such for any desired purpose.

Baer—U. S. Pat. 1,869,734—August 2, 1932. *Plastic Products.*

In a method of producing an elastic-plastic material, a plastic reaction product of ethylene dichloride with an alkali metal or alkali earth metal polysulfide is dissolved in carbon disulfide and mixed with a quantity of natural rubber latex to obtain a yellowish pasty mass which is plastic and elastic on removal of the liquid solvent and can be cold cured. In the example given, a plastic polyethylene polysulfide (100) is dissolved in carbon disulfide and natural rubber latex (20) added. On evaporation of the solvent there is recovered a plastic-elastic mass which can be cold cured like natural rubber.

Lommel et al—U. S. Pat. 1,874,934—August 23, 1932. *Vulcanized Products.* (Assigned to I. G. Farbenindustrie A. G., Germany).

This patent deals with the vulcanization of natural or synthetic rubber in the presence of an accelerator having the formula

$$\begin{matrix} R_1 & & & & R_1 \\ & >N\text{-}C\text{-}S\text{-}C\text{-}S\text{-}C\text{-}N< & & & \\ R_2 & & & & R_2 \end{matrix}$$

in which R_1 is a cyclohexyl group and R_2 is an H.C. radical which may be linked to R_1 to form a ring configuration and

includes benzal-bis- (methylcyclohexyldithiourethan) etc. In one example, using a synthetic rubber, a composition comprising sodium-butadiene rubber (100), lamp black (60), zinc white (15), pine tar (4), stearic acid (2), sulfur (1), and accelerator (0.6) is rolled or kneaded and vulcanized at 150° C. for 40 minutes to obtain a vulcanizate having a tensile strength of 150 Kg./cm² at a stretch of 575%.

Lommel et al—U. S. Pat. 1,874,935—August 23, 1932. *Vulcanization.* (Assigned to I. G. Farbenindustrie A. G., Germany).

Natural or synthetic rubbers are vulcanized in the presence of thio-alkyl-cyclohexylamine. In one example, sodium butadiene rubber is compounded and vulcanized as in U. S. Pat. 1,874,934, using 1.8 parts of di (thio-methyl-ethyl-cyclohexylamine) as the accelerator. In another example, using the same composition described in U.S. Pat. 1,874,934, di (N-thiodecahydroquinaldine) is used as the accelerator.

Lommel et al—U. S. Pat. 1,874,936—August 23, 1932. *Vulcanization.* (Assigned to I. G. Farbenindustrie A. G., Germany).

Butadiene rubbers or natural rubber are vulcanized in the presence of an accelerator which is the salt of dithio-carbamic acid having the formula

$$\begin{matrix} R_1 \\ R_2 \end{matrix} > N\text{-}C\text{-}SH$$

in which R_1 is a cyclohexyl group and R_2 is an H.C. radical which may be linked to R_1 to form a ring. The same sodium butadiene rubber composition cited in U.S. Pat. 1,874,934 is vulcanized in the presence of 1% decahydroxy-quinaldine dithio-carbamate or 0.67% of the cyclohexylbenzylamine salt of cyclohexyl-benzyl-dithio-carbamic acid.

Schmidt et al—U. S. Pat. 1,882,976—October 18, 1932. *Sulfurized Polybutadiene Products.* (Assigned to I. G. Farbenindustrie A. G., Germany).

A non-distillable product of polymerized butadiene is heated at 100° to 500° C. in the absence of oxygen but in the presence of sulfur to produce a mass which has the tensile strength and elasticity of vulcanized natural rubber, and when dissolved in a solvent will produce a lacquer material of excellent quality. In one example, a 5% solution of sodium butadiene rubber is filmed on a metal surface, dried, exposed to the vapors of sulfur chloride, and then heated at 180° C. for one hour to obtain a non-elastic and strongly adherent film which is highly resistant to heat and chemicals. In another example, a 25% cyclohexanol solution of sodium butadiene rubber is admixed with 2 to 3% of polymerized sulfur dissolved in carbon disulfide and the solution spun into threads by passing it through spinnerets and into vertically arranged pipes which are heated gradually downward up to a temperature of 400° C. and which are filled with inert gas, thereby producing butadiene rubber threads of great strength and elasticity. These threads can be colored. If the threads are heated at low temperature or for a short time a silver lustre will be achieved; a golden lustre results from heating at higher temperature or for a longer time. If desired, the thread may be treated with tungstate or phosphotungstate, or the solution from which the threads are made may contain tri-cresyl phosphate, etc., to reduce the inflammability. Yarns prepared from such threads are particularly useful for covering electrical conducting wires.

Patrick and Monookin—U. S. Pat. 1,890,231—December 6, 1932. *Vulcanized Products.*

The polyethylene polysulfides obtained by reacting a polyalkylene polyhalide with the polysulfide of sodium, potassium, ammonium, calcium, etc., is admixed with varying quantities of natural rubber, fillers, pigments, etc., to obtain soft rubber-like vulcanizates. The sulfur for vulcanizing the rubber is obtained from the polysulfide plastic, which also acts as an accelerator of vulcanization, but sulfur as well as accelerator, such as diphenylguanidine, hexamethylene tetramine, aldehyde-ammonia, aniline, thiocarbanilide, etc., may be added. The following examples are given: I—Hard polyethylene polysulfide—68.6% sulfur—(28.5), rubber latex (28.5), sulfur (25.6), zinc oxide (17.4). II—Soft polysulfide plastic—83% sulfur—(35.6), rubber latex (35.6), sulfur (14.3), zinc oxide (14.5). Both of these compositions are cured at 275° F. for 70 minutes to obtain vulcanizates of high tensile strength and low permanent set. III—Soft polysulfide plastic—84% sulfur—(69.3), smoked rubber sheet (6.9), sulfur (6.9), lead oxide (6.9), hard wood pitch (6.9), carbon black (2.8), thiocarbanilide (0.3). This composition is cured at 270° F. for 105 minutes and results in a product with lower tensile strength and higher permanent set than those in I and II. IV—Soft polysulfide plastic—83% sulfur—(24.5), smoked rubber sheet (36.7), sulfur (18.4), zinc oxide (12.3), zinc stearate (2.5), hard wood pitch (2.5), carbon black (2.5), pine tar (0.3), accelerator (0.3). Cure same as in I and II. In these compositions increasing the amount of natural rubber increases the tensile strength and decreases the permanent set of the products which are in general highly resistant to oxidation and sun cracking.

Schmidt et al—U. S. Pat. 1,901,044—March 14, 1933. *Polybutadiene Rubber Treatment.* (Assigned to I. G. Farbenindustrie A. G., Germany).

This patent treats with the same subject matter as that of U.S. Pat. 1,882,976 which in turn treats with the heating of polybutadienes at high temperatures in the absence of oxygen to obtain varnish materials, textile threads, coatings, etc., joining glass to glass to form safety glass, etc. Several examples are given, as follows:

I—Sodium butadiene rubber is heated at 250° to 300° C. in the absence of air to obtain a colorless, clear-crystal mass which may be used as a substitute for glass or for making transparent foils.

II—A 33% solution of the same polybutadiene in cyclohexane is heated in an autoclave at 250° to 300° C. for 15 to 20 hours to obtain a colorless substance with unchanged cyclohexane.

III—Sodium polybutadiene rubber (60) is rolled with lamp black (40) and heated in a mold at 150° C. and a pressure of 50 atmospheres for two to three hours. After removing the resulting product from the mold it is heated at 250° C. for two to three hours, obtaining a highly-polished product.

IV—A polymerized 1-methyl butadiene (piperyline) obtained in the presence of 0.5% $AlCl_3$ is dried at 150° C. and molded at 250° to 300° C. for several hours.

V—Sodium butadiene rubber (10) is admixed with emery powder (60) and pressed at a pressure of 150 to 300 atmospheres at 150° C. to form abrasive discs which are then heated at 275° to 300° C.

VI—A 30% solution of purified sodium butadiene rubber is spun into threads as described in U.S. Pat. 1,882,976, heating the pipes up to 400° C. in an atmosphere of CO_2, N_2, CH_4, H_2, etc., to form lustrous, elastic threads which are stretched and wound on bobbins. Instead of using sodium butadiene rubber in the above processes, other polybutadiene compounds can be used. Thus, the sodium butadiene rubber can be admixed with 50% of a poly-isoprene or purified natural rubber.

VII—A metal bobbin may be dipped in a 5% solution of sodium butadiene rubber and the coating dried and hardened at 100° to 150° C. Such a bobbin is highly resistant to the chemicals used in the production of artificial silk.

In still another example, the butadiene rubber is mixed with bleached kieselguhr, pigments, etc., in large quantities and molded at high pressure.

(To Be Continued)

The George Scherr Co., Inc., 128 Lafayette St., New York City, has brought out a new **tool stand** designed primarily to serve as a vise or clamp for holding micrometers, snap gages, and other tools. Use of the stand assures more accurate measurements since the tools are isolated from body heat.

Domestic Rubber Plant Investigation Launched by United States Rubber Co.

Program Includes Use of Experimental Plantation in Arizona Where Thousands of Rubber-Bearing Plants Will Be Cultured

SEVERAL months ago the United States Rubber Company decided to start an investigation looking forward to locating additional domestic sources of rubber. The investigation was placed in the hands of Dr. John McGavack, department head of the General Laboratories at Passaic, N. J. The search was begun with a complete review of the work of Thomas E. Edison on this subject, and to date thousands of plants have been under careful scrutiny, the question as to whether their juices could be converted into useful rubber being determined by means of X-ray investigation.

Plantation Leased Near Yuma

Based on encouraging results in the laboratory, the company has decided to expand its investigation of wild rubber sources and has leased an experimental plantation for the culture of rubber-yielding plants near Yuma, Arizona, where a field laboratory is being installed. Although present acreage is fairly small, arrangements have been made to lease additional acreage when required. R. E. Beckett, formerly of the Department of Agriculture Experiment Station, at Bard, California, has been placed in charge of the Arizona project. Use of X-ray equipment will be made at the field laboratory.

Object is "Useful Rubber"

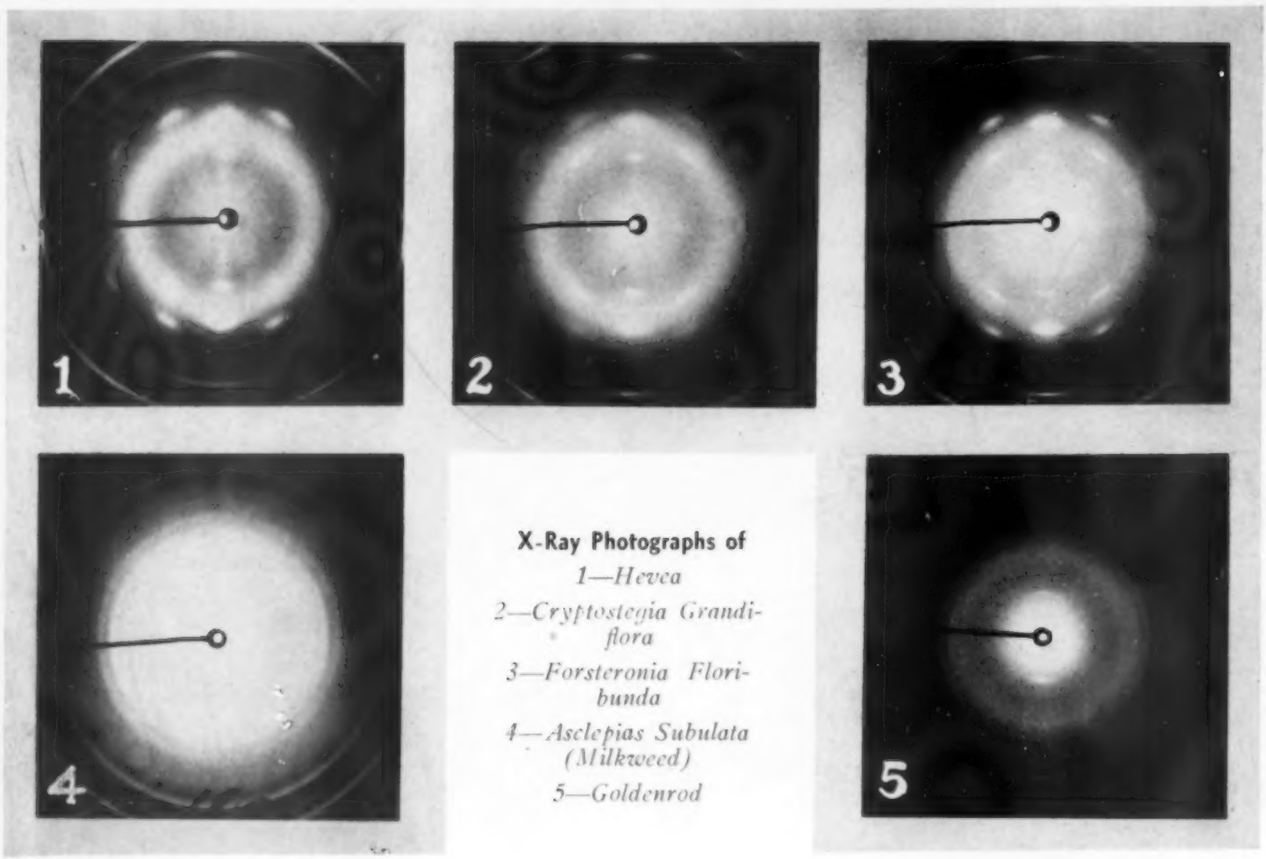
Edison's investigations, launched but a few years before his death, and financed in part by Harvey S. Firestone, Sr., and Henry Ford, covered more than 17,000 native plants, of which approximately 250 were found to have a rubber content high enough for commercial consideration, the common dandelion and ordinary milkweed being among them. Edison's experiments went little beyond the determination of rubber content, however, and were not concerned with practical usage of the rubber yielded. At the time the venerable inventor estimated that satisfactory rubber could be extracted from some of these plants at a cost of approximately $25.00 a pound. Commercially, therefore, the cost of extraction was prohibitive.

Dr. McGavack stresses the term "useful rubber" when discussing the current experimental program. By that term is meant rubber which can be vulcanized and used in the manufacture of finished products. For instance, he points out, there are plants such as milkweed which contain a rubber-like substance and which exist in substantial quantities, but milkweed rubber is not useful because the vulcanized product has poor properties, a fact clearly revealed by X-ray examination.

Several Plants Show Good Promise

The study to date, according to Dr. McGavack, has revealed a number of plants which contain good rubber and which show promise for future development. Two of the most promising are the *Forsteronia Floribunda*, a plant native to Central America, and the *Cryptostegia Grandiflora*, now grown in Florida, California and Arizona. The latter gives indication of approximately 4% rubber and 8% resin content. Although exact determination of the rubber and resin

Dr. John McGavack, in charge of U. S. Rubber's wild rubber research, about to take an X-ray photograph of one of the many specimens.



X-Ray Photographs of

1—Hevea

2—Cryptostegia Grandiflora

3—Forsteronia Floribunda

4—Asclepias Subulata (Milkweed)

5—Goldenrod

content of the *Forsteronia Floribunda* has not yet been made, it is believed that the resin content will be approximately double that of the rubber content, as in the case of the *Cryptostegia Grandiflora*.

Will Give Regular Annual Yields

It is particularly interesting to note that both of these plants show an X-ray pattern quite similar to a good quality of *Hevea brasiliensis*. Both plants will yield annual crops of rubber whereas guayule requires four to five years for a substantial harvest, according to Dr. McGavack. Some of the plants under consideration, he adds, will yield semi-annual crops. Also of special interest is the fact that some of these plants may lend themselves to tapping operations, renewing their rubber content periodically, instead of being submitted to the extraction process, as is the case with guayule. In one experiment, a 30% solids latex was secured by tapping. Other experiments conducted to date indicate that goldenrod rubber has a tensile from 800 to 900 and milkweed rubber only from 600 to 700.

Accompanying this article are reproductions of X-ray photographs made by U. S. Rubber in its search for domestic rubber-yielding plants. As is generally known, true rubber shows a crystal structure, denoted in X-ray photographs by white spots on the rim of the sphere. It will be noted that the photographs of *Hevea brasiliensis*, *Cryptostegia Grandiflora* and *Forsteronia Floribunda* (1, 2 and 3, respectively on the reproduction) show similar patterns of spots, indicating that the plants have the same rubber value.

On the other hand, the X-ray photograph of *Asclepias Subulata* (milkweed), No. 4 on the reproduction, shows no white spots whatsoever, thus indicating an entirely different type of plant with little or no useful rubber. The fifth photograph, that of goldenrod, is quite different from that of Hevea rubber, and while it does not show white spots as such it does show some orientation, indicating crystalline structure when stretched. All of these X-ray photographs were taken of sample sheets of material vulcanized from compounded resins of the plants, each sample being 1/10th-inch thick and stretched 300 to 400 per cent.

Work Is Primarily for the Future

It should be emphasized that neither the plants discussed above nor the work being done with other plants at the U. S. Rubber experimental plantation in Arizona will solve the current critical rubber shortage. After useful varieties of rubber-yielding plants have been determined, much time is required to accomplish large scale multiplication of these plants through production of seed or by making cuttings. Therefore, as Dr. McGavack points out, this work is primarily for the future. Its importance, however, cannot be overemphasized.

Maximum Price Regulation No. 149 on Mechanical Rubber Goods

THE order establishing ceilings on manufacturers' prices for standard mechanical rubber goods was issued by the Office of Price Administration on May 23, effective May 27. The order includes a formula for computing maximum prices on specially designed items. The full text of the order—Maximum Price Regulation No. 149 on Mechanical Rubber Goods—is reproduced below in full, followed by a statement of considerations involved in its issuance.

Maximum Price Regulation No. 149

In the judgment of the Price Administrator the prices of mechanical rubber goods have risen to an extent and in a manner inconsistent with the purposes of the Emergency Price Control Act of 1942. The Price Administrator has ascertained and given due consideration to the prices of mechanical rubber goods prevailing between October 1 and October 15, 1941, and has made adjustments for such relevant factors as he has determined and deemed to be of general applicability. So far as practicable, the Price Administrator has advised and consulted with representative members of the industry which will be affected by this Regulation.

In the judgment of the Price Administrator the maximum prices established by this Regulation are and will be generally fair and equitable and will effectuate the purpose of said Act. A statement of the considerations involved in the issuance of this Regulation has been issued simultaneously herewith and filed with the Division of the Federal Register.

Therefore, under the authority vested in the Price Administrator by the Emergency Price Control Act of 1942, and in accordance with Procedural Regulation No. 1, issued by the Office of Price Administration, Maximum Price Regulation No. 149 is hereby issued.

1. *Maximum manufacturers' prices for mechanical rubber goods:* (a) On and after May 27, 1942, regardless of any contract, agreement, lease or other obligation, no manufacturer shall sell or deliver mechanical rubber goods, and no person shall buy or receive mechanical rubber goods, from a manufacturer in the course of trade or business, at prices higher than the maximum price; and no person shall agree, offer, solicit or attempt to do any of the foregoing. The provisions of this section shall not be applicable to sales or deliveries of mechanical rubber goods to a purchaser if prior to May 27, 1942 such mechanical rubber goods had been received by a carrier, other than a carrier owned by or controlled by the manufacturer for shipment to such purchaser.

(b) The maximum price for mechanical rubber goods of the types and kinds listed in Appendix A, incorporated herein, shall be as follows:

(1) The maximum price shall be the price stated in the schedule or price list of the manufacturer in effect on October 1, 1941, or the price he regularly quoted in any other manner on that date, for mechanical rubber goods of the same class, kind, type, condition and grade less all trade, cash, quantity, advance buying and other discounts, freight allowances and rebates, postage allowance and rebates and any other deductions from the list price in effect for a purchaser of the same class on October 1, 1941.

(2) If the maximum price cannot be determined under paragraph (b) (1) of this section 1, the maximum price shall be the sum total of direct labor and direct materials costs plus a gross margin, expressed in dollars and cents, which the manufacturer would have added to the total direct costs in arriving at his selling price to a purchaser of the same class on October 1, 1941. The direct labor costs shall be determined on the basis of wage rates in effect to the manufacturer on October 1, 1941. The direct materials costs shall be determined by the net materials prices prevailing for the manufacturer or a manufacturer of the same class on October 1, 1941. The gross margin shall be calculated by the same methods and the same rates used by the manufacturer on October 1, 1941, which shall be the methods and rates filed in accordance with the provisions of paragraph (a) of section 8. If the manufacture of a mechanical rubber good requires the use of materials, labor, or equipment, the October 1, 1941 price of which is not ascertainable, the cost of such items to be used in determining the maximum price shall be the first ascertainable price after October 1, 1941.

(3) No manufacturer shall require any purchaser, and no purchaser shall be permitted, to pay a larger proportion of transportation costs incurred in the delivery or supply of any mechanical rubber goods than the manufacturer required purchasers of the same class to pay on October 1, 1941 on deliveries or supplies of the same types, kinds and quantities of mechanical rubber goods.

(c) The maximum price for all mechanical rubber goods not of the types and kinds listed in Appendix A, incorporated herein, shall be determined in the same manner as that stated in paragraph (b) of this section 1, except that the date January 5, 1942 shall in every case be substituted for the date October 1, 1941.

(d) The maximum prices set forth in this section shall not be increased by any charges for the extension of credit.

2. *Federal and state taxes:* There may be added to the maximum price established by this Maximum Price Regulation No. 149 the amount of tax levied by any Federal excise tax statute or any State or municipal sales, gross receipts, or compensating use tax statute, under which the tax is measured by gross proceeds or units of sale, if, but only if, (a) such statute or ordinance requires the vendor to state the tax separately from the purchase price paid by the purchaser, consumer, or user, on the bill, sales check, or evidence of sale, at the time of the transaction; or (b) such statute or ordinance requires such tax to be separately paid by the purchaser, consumer or user with tokens or other media of State or municipal tax payments; or (c) such a statute or ordinance permits the vendor to state such tax separately and such tax is in fact stated separately by the vendor. The amount of tax permitted to be added by this provision shall in no event exceed that paid by the purchaser, consumer or user.

3. *Sales for export:* The maximum price at which a manufacturer may sell or deliver any mechanical rubber goods for export shall be determined in accordance with the provisions of the Maximum Export Price Regulation issued by the Office of Price Administration on April 25, 1942.

4. *Transfer of business or stock in trade:* If the business, assets or stock in trade of any business are sold or otherwise transferred after October 1, 1941, and the transferee carries on the business, or continues to deal in the same type of mechanical rubber goods, in the same competitive area and in an establishment separate from an establishment previously owned or operated by him, the transferee shall be subject to

the same maximum prices as those to which his transferor would have been subject under this Maximum Price Regulation No. 149, if no such transfer had taken place, and his obligation to keep records sufficient to verify such prices shall be the same. The transferor in such cases shall either preserve and make available, or turn over, to the transferee all records of transactions prior to the transfer which are necessary to enable the transferee to comply with the provisions of this Maximum Price Regulation No. 149.

5. *Less than maximum prices:* Lower prices than those established by this Maximum Price Regulation No. 149 may be charged, demanded, paid or offered.

6. *Evasion:* The price limitations set forth in this Maximum Price Regulation No. 149 shall not be evaded, whether by direct or indirect methods, in connection with an offer, solicitation, agreement, sale, delivery, purchase or receipt of, or relating to, mechanical rubber goods, alone or in conjunction with any other commodity or by way of commission, service, transportation or other charge, or discount, premium or other privilege, or by tying-agreement or other trade understanding, or otherwise.

7. *Records:* Persons subject to this Maximum Price Regulation No. 149 shall keep available for inspection by representatives of the Office of Price Administration records of the following:

(a) For each sale or delivery of mechanical rubber goods after May 26, 1942, showing the date thereof, the name and address of the buyer, the price received, and the quantity of each class, kind, type, condition, and grade of mechanical rubber goods sold or delivered.

(b) For all mechanical rubber goods listed in Appendix A, incorporated herein:

(1) Published or confidential price lists and discount sheets in effect on October 1, 1941.

(2) Price determining methods—including labor rates, material prices and rates used in the calculation of gross margin—in effect on October 1, 1941.

(3) Detailed cost estimate sheets and other data showing the calculations of prices of all mechanical rubber goods sold or delivered after May 26, 1942 for which the price lists of the manufacturer in effect on October 1, 1941 did not state a price.

(c) For all mechanical rubber goods not listed in Appendix A, incorporated herein, the same records as those required by paragraph (b) of this section 7 except that the date, January 5, 1942 shall in every case be substituted for the date, October 1, 1941.

8. *Reports:* (a) Every manufacturer subject to the provisions of this Maximum Price Regulation No. 149, who has not already done so, shall file with the Office of Price Administration, Washington, D. C. on or before June 1, 1942:

(1) For all mechanical rubber goods listed in Appendix A, incorporated herein:

(i) Published or confidential price lists and discount sheets in effect on October 1, 1941.

(ii) Price determining methods used on October 1, 1941 for those articles for which the manufacturer did not have a price list in effect on that date. The report of such methods shall include a statement of the rates which the manufacturer would have used in determining the gross margin on October 1, 1941 at the volume of production on that date.

(2) For all mechanical rubber goods, not listed in Appendix A, incorporated herein, the same reports as those required by paragraph (a) (1) of this section 8 except that the date January 5, 1942 shall in every case be substituted for the date October 1, 1941.

(b) If, with respect to the types and kinds of mechanical rubber goods listed in Appendix A, incorporated herein, the schedule or price list of the manufacturer in effect on October 1, 1941, did not state a price for mechanical rubber goods of the same class, kind, type, condition, and grade, the manufacturer shall, within ten days after the purchaser has agreed to buy such goods, file a report with the Office of Price Administration, Washington, D. C., if he has not already done so, stating the maximum price determined under this Regulation and his net selling price. Where a purchaser has agreed, prior to May 27, 1942, to buy such mechanical rubber goods and any part thereof is delivered on or after May 27, 1942, this report shall be filed on or before June 1, 1942. If the manufacture of such mechanical rubber goods requires the use of materials, labor or equipment, the October 1, 1941 prices of which are not ascertainable, the manufacturer shall file at the same time: a description of such goods, the reasons why the October 1, 1941, prices of materials, labor or equipment, as the case may be, are not ascertainable, the first ascertainable price thereof after October 1, 1941, and the method by which such price was determined.

(c) If, with respect to the types and kinds of mechanical rubber goods not listed in Appendix A, incorporated herein, the schedule or price list of the manufacturer in effect on January 5, 1942, did not state a price for mechanical rubber goods of the same class, kind, type, condition and grade, the manufacturer shall, within ten days after the purchaser has agreed to buy such goods, file the same report as that required by paragraph (b) of this section 8, except that in every case the date January 5, 1942, shall be substituted for the date October 1, 1941. Where a purchaser has agreed, prior to May 27, 1942, to buy such mechanical rubber goods and any part thereof is delivered on or after May 27, 1942, this report shall be filed on or before June 1, 1942.

(d) Every person subject to this Maximum Price Regulation No. 149 shall keep such other records and submit such other reports, including periodic financial statements, as the Office of Price Administration may from time to time require, either in addition to, or in substitution for, records and reports herein required.

9. *Enforcement:* (a) Persons violating any provisions of this Maximum Price Regulation No. 149 are subject to the criminal penalties, civil enforcement actions, and suits for treble damages provided for by the Emergency Price Control Act of 1942.

(b) Persons who have evidence of any violation of this Maximum Price Regulation No. 149 or any price schedule, regulation, or order issued by the Office of Price Administration or of any acts or practices which constitute such a violation are urged to communicate with the nearest District, State or Regional Office of the Office of Price Administration or its principal office in Washington, D. C.

10. *Petitions for amendment:* Persons seeking any modification of this Maximum Price Regulation No. 149 may file petitions for amendment in accordance with the provisions of Procedural Regulation No. 1, issued by the Office of Price Administration.

11. *Definitions:* (a) When used in this Maximum Price Regulation No. 149, the term:

(1) "Gross margin" means the difference, expressed in dollars and cents, between (i) the total direct materials and direct labor cost and (ii) the net selling price which would have been charged to a purchaser of the same class on the base dates established by this Regulation. It includes only items (such as, factory overhead, depreciation, commercial expenses, transportation and warehouse expense, and margin of profit) that would have been used, at the rates that would have been used, in calculating the selling price for the article in question on October 1, 1941 or January 5, 1942, whichever is the applicable date. The rates used shall be those in effect at the volume of production on the base date.

(2) "Manufacturer" means any person engaged in the production of mechanical rubber goods.

(3) "Mechanical rubber goods" means all articles listed in Appendix A, incorporated herein, and mats and matting, molded, extruded and lathe-cut goods, rubber covered rolls, sponge rubber goods, hard rubber goods, rubber flooring, foamed latex products and all other mechanical rubber goods, except rubber covered wire, stationery supplies, mechanical rubber goods whose entire rubber content is balata rubber, rubber drug sundries, rubber heels and soles, rubber cement, combs, and sporting goods.

(4) "Person" includes an individual, corporation, partnership, association, or any other organized group of persons, or legal successor or representative of any of the foregoing,

and includes the United States or any agency thereof, or any other government, or any of its political subdivisions, or any agency of any of the foregoing.

(5) "Purchaser of the same class" refers to the practice adopted by the manufacturer in setting different prices for commodities for sales to different purchasers or kinds of purchasers (for example, manufacturer, wholesaler, jobber, retailer, government agency, public institution, individual consumer) or for purchasers located in different areas or for different quantities or grades or under different conditions of sale.

(6) "Rubber" means all forms and types of rubber, including synthetic and reclaimed rubber.

(b) Unless the context otherwise requires, the definition set forth in Section 302 of the Emergency Price Control Act of 1942 shall apply to other terms used herein.

12. *Applicability of the General Maximum Price Regulation:* The provisions of this Maximum Price Regulation No. 149 supersede the provisions of the General Maximum Price Regulation with respect to sales and deliveries for which maximum prices are established by this Regulation.

13. *Effective Date:* This Maximum Price Regulation No. 149 shall become effective May 27, 1942: Provided, That

(a) On and after May 22, 1942 and before May 27, 1942, mechanical rubber goods may be sold or delivered by manufacturers either at the maximum prices established by the General Maximum Price Regulation or at the maximum prices established by this Maximum Price Regulation No. 149.

(b) The provisions of this Maximum Price Regulation No. 149 shall not apply:

(1) Until June 15, 1942 to deliveries under contracts with the United States or any agency thereof entered into prior to May 18, 1942, except deliveries under contracts with the War Department or the Department of the Navy of the United States:

(2) Until July 1, 1942, to sales or deliveries to, or contracts with, the War Department or the Department of the Navy of the United States.

APPENDIX A

Mechanical rubber goods whose maximum price is established by paragraph (b) of section 1: Paragraph (b) of section 1 establishes the maximum prices for belting, hose and tubing, jar rings and container sealing compounds, lined tanks, pipes and fittings, packing, plumber's supplies and specialties, tape and thread, made in whole or in part of rubber.

Issued this 22nd day of May, 1942.

LEON HENDERSON
Administrator

Statement of Considerations Involved in the Issuance of M. P. R. No. 149 on Mechanical Rubber Goods

This Regulation is a companion measure to the General Maximum Price Regulation. The General Maximum Price Regulation within the limits of statutory authorization and administrative feasibility established maximum prices for all commodities and services for which maximum prices had not hitherto been fixed. The statement of considerations issued therewith fully describes the inflationary situation demanding overall price action by the Office of Price Administration. The present statement of considerations, therefore, is concerned primarily with the reasons why a separate regulation for mechanical rubber goods is necessary, and with the fairness and equitableness of its maximum price provisions.

The Industry

Prior to the restrictions on rubber consumption, made necessary by the scarcity of this commodity, mechanical rubber goods production amounted to some eight to ten per cent of the total production of the rubber manufacturing industry in terms of crude rubber consumption. The manufacture of mechanical rubber goods has been customarily regarded by rubber manufacturers as a separate industry, apart from the production of other rubber articles. Many firms produce only mechanical rubber goods. Even those companies which produce other items than mechanical rubber goods usually maintain a separate department for the production of these commodities.

One of the important characteristics of the mechanical rubber goods industry is the large volume of direct sales by manufacturers to equipment producers and direct industrial users. Over one-half of the industry's production is sold directly by manufacturers to users, and a very small proportion reaches the user through retail outlets. The contrast to those industries devoted directly to the satisfaction of consumers' needs is obvious. In addition, mechanical rubber goods manufacturers, especially those producing molded, extruded and lathe-cut goods, an important group of items not included in Appendix A of this Regulation, have problems arising from the large proportion of their production devoted to specially engineered or specially designed products. "Standard items" for which prices are quoted in catalogues covered little more than one-half of the total production of mechanical rubber goods manufacturers before the imposition of the rubber restrictions. List prices for molded, extruded and lathe-cut goods are the exception rather than the rule.

Perhaps the most important characteristic of the industry is that a large proportion of its products are essential parts entering at a very early stage into the production of essential machinery for military and civil needs. In this respect, for many producers, mechanical rubber goods are comparable to raw materials. Price increases at these levels, therefore, although not immediately reflected through intermediate stages of production and distribution, may appear at a later time in exaggerated form.

Standard items, such as belting and hose, are sold most frequently by relatively large mechanical rubber goods companies or general rubber producers with mechanical goods departments. Profit margins have been generally higher on these goods than on the many molded, extruded and lathe-cut items sold on a "bid" price basis where several hundred small firms compete for the business with larger companies.

The Reasons for a Separate Regulation

Because the amount and importance of "specially designed" products are so great in this industry, adequate regulation of mechanical rubber goods prices can not be achieved within the necessarily general language of the General Maximum Price Regulation, but requires the use of procedures adapted to meet the peculiar problems raised by these non-standard products. At meetings held May 4, 6, 7 and 8, 1942, in Washington, Cleveland, New York and Boston, with representative members of the industry, the companies there represented were unanimous in the opinion that some separate regulation was required at once for the mechanical rubber goods in-

dustry in order to prevent delay in the production of essential parts for planes, tanks, gunmounts, submarines and other essential military equipment.

Further it is necessary that lower prices than those in effect during March, 1942 be established as maximums for mechanical rubber goods in order to achieve the purposes of the General Maximum Price Regulation. One basic purpose of that Regulation is to hold the March level of retail prices. Since a great proportion of mechanical rubber goods is used in the manufacture of machinery which produces consumers' goods, the effect of a rise in prices of mechanical rubber goods is not reflected in the price of consumers' goods until some time after this rise in price has been put into effect. It is obvious, therefore, that some date earlier than March must be used as a basis for determining the maximum price of mechanical rubber goods.

Like considerations have already resulted in the establishment of maximum machinery and machinery part prices at the October 1, 1941 level by the issuance of Maximum Price Regulation No. 136. The fact that a great proportion of mechanical rubber goods enters into the production of machinery and machinery parts, supplies an additional reason why some date earlier than March should be used as a basis for establishing prices for mechanical rubber goods.

Fairness and Equitableness of the Maximum Price Provisions

The Emergency Price Control Act of 1942 requires the Administrator in establishing maximum prices to ascertain and give due consideration to the prices prevailing between October 1 and October 15, 1941. An examination of prices, costs and profits figures demonstrates that October 1, 1941 prices are generally fair and equitable for the standard articles included in Appendix A of this Regulation. Profits for manufacturers of mechanical rubber goods in 1941 generally were excellent. Using the base suggested in the Statement of Considerations accompanying the General Maximum Price Regulation, profits of manufacturers producing mechanical rubber goods increased substantially over 1936-1939 profits as is shown by the profit figures, before deduction of Federal income and excess profits taxes, of companies representing 64.8% of the industry in terms of crude rubber consumption during the last quarter of 1941. In the following table 1936-1939 average profits equal 100:

1936	111.5
1937	114.0
1938	59.0
1939	115.5
1940	137.4
1941	310.1

Since many manufacturers made price increases during the Spring and Summer of 1941, the prices in effect on October 1, 1941 were not fully reflected in the profit figures. Thus if October 1, 1941 prices had been in effect all during the year, the profits would have been still greater.

Costs of labor and material have risen to some extent since October 1, 1941. As of the end of February, 1942 average hourly wage rates were over 5% greater than those paid by mechanical rubber goods manufacturers in October, 1941. The prices of compounding materials and fabrics have advanced in certain cases substantially since that date. These increases in cost, however, do not necessitate a rise in the prices of so-called standard items because of the relatively high level of profits realized thereon. October 1, 1941 prices are not substantially different from the March, 1942 prices on many of these items. At the industry meetings no serious objection was made by representative mechanical rubber goods producers to a proposed establishment of maximum prices at the October 1, 1941 level for most of these articles.

These standard items also represent a large proportion of the mechanical rubber goods used in the production of machinery and machinery parts. Since the maximum price for machinery and machinery parts has been established at the October 1, 1941 level, it is necessary that the maximum price of the constituent parts of machinery and machinery parts be established at the same level.

In the case of so-called molded, extruded and lathe-cut goods, however, it has been asserted by members of the industry at the meetings referred to above that an October 1, 1941 base would be inequitable because increased material and labor costs could not be absorbed by the small margin of profits customary for this class of goods; and it was even contended that an October 1, 1941 base would result in their inability to offer some of these goods for sale. Furthermore, the restrictions on rubber consumption promulgated by the War Production Board have fallen much more heavily on this type of production than on belting, hose and other standard mechanical rubber goods. In the light of these representations, the date January 5, 1942 was selected in order that maximum prices be established at a level that reflected increased labor and material costs.

Because of the complexity of the industry and because complete cost information could not be obtained within the necessarily short period within which action had to be taken, this Regulation may have to be amended when more complete information has been acquired. Also the determination of whether or not the maximum prices established by this Regulation are at a sufficiently low level to accomplish the purposes of the General Maximum Price Regulation can only be made in the light of experience. Thus it may be necessary to establish maximum prices for mechanical rubber goods lower than those established by this Regulation in order to accomplish the objectives of the General Maximum Price Regulation and more fully effectuate the purposes of the Emergency Price Control Act of 1942.

In the light of the foregoing circumstances, it is the judgment of the Price Administrator that the maximum prices established by this Regulation are generally fair and equitable and will effectuate the purposes of the Emergency Control Act of 1942.

Issued this 22nd day of May, 1942.

LEON HENDERSON
Administrator

Kok-Sagyz, Family Compositae, As a Practical Source of Natural Rubber for the United States. By Dr. Paul J. Kolachov. Published by the National Farm Chemurgic Council, 50 W. Broad St., Columbus, Ohio. 7 x 10 in. 20 pp. 25c.

This booklet is a reproduction of the address on *Kok-Sagyz* given by the author at the Symposium on the Florida Rubber Situation presented at the Webber College Business Conference held at Babson Park, Florida, on February 11, 1942. The case for *Kok-Sagyz*, the Russian rubber-bearing plant, is clearly stated. In addition to a description of the plant, the booklet contains information on cultivation, soil and rainfall required, fertilization, planting time, sowing, care, harvesting and yields. The economic aspects are also discussed.

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Laboratory Reports on Various Grades of Spheron in Highly Loaded Stocks. Godfrey L. Cabot, Inc., 77 Franklin St., Boston, Mass. 8¾ x 11½ in. 6 pp.

Some information on the behavior of various grades of Spheron carbon black at high loadings in both all-reclaim stocks and in high-grade stocks has recently been accumulated by Cabot in the course of laboratory investigations. This bulletin contains a condensed resume of the more pertinent of the experimental data sheets. It is divided into five sections, as follows: (1) Varied Spheron Loadings in Reclaim Stocks; (2) Various Grades of Spheron in Reclaim Stocks; (3) Blends of Spheron with P-33 Black in Reclaim Stocks; (4) Various Blacks in High Quality Stocks; (5) Blends of Spheron N with P-33 in High Quality Stocks.

Editorials

The Truman Report

THE report of the Truman Committee, given to the Senate last month, was truly disappointing. Although the committee claimed to be "fact-finding" rather than "fault-finding" its report nevertheless constituted an all-around criticism. It charged the Army with being careless of its tires, the automotive industry for indulging in "an orgy of rubber consumption" as late as last year, Standard Oil with retarding the development of Butyl rubber, and the government in general for the inordinate delay in formulating a synthetic rubber program.

The picture which emerges from the report is that of a nation utterly unprepared for a predictable international calamity and much too long without even a central authority to bring order out of chaos. The lengthy report is actually a series of accusations rather than one outlining a clear policy for the future as many hoped it would be. As we have stated time and again in these columns efforts to put the blame on any person, group of persons, company or corporation will not bring synthetic rubber productive capacity one step nearer.

It is so evident that unless synthetic rubber reaches appreciable output proportions by mid-1943 the United Nations will face a lag in supply that we feel that full attention should be centered in that program. If some person or corporation is guilty of wrongdoing in the current program, by all means investigate and prosecute. But let's put pre-war accusations on the shelf for the duration and concentrate on winning the war. There are still some bottlenecks in the program, particularly large scale production of basic raw materials. It is far more important at this stage of the game to produce than to provoke.

If the effect of the Truman report, however, will in any manner stimulate the synthetic rubber program, then the hearings will have achieved some good.

Selection of Elliot Simpson

WITHIN the past few days Elliot E. Simpson was appointed non-salaried counsel to the House Committee on Coinage, Weights and Measures. The committee has been hearing testimony on the proposal to earmark $250,000,000 from the government's stabilization fund to purchase raw rubber. Mr. Simpson, according to his numerous and frequent press releases, is a "director" of L. Drexsage Co., an "independent" rubber dealer of New York City, an "associate" of several rubber manufacturing companies, and has a "background" of 26 years in the rubber field.

Mr. Simpson has distinguished himself of late by setting a near-record for appearances before various Congressional committees investigating the rubber situation. In practically all of these appearances he has pursued a single theme: The rubber shortage is a "myth" and a "fake." Among the numerous charges he has made are: there is a minimum of 10,000,000 tons of scrap rubber in this country; if $500,000,000 were spent to take rubber out of Latin America this country could get more than enough rubber for military and civilian use; $40,000,000 would be enough to put up plants to reclaim 2,000,000 tons of scrap.

Was Mr. Simpson selected as counsel to the committee in question because of his "acknowledged" standing in the rubber industry as an expert and authority or because of his ability to wield big figures? The answer seems to stem from a recent comment on his appointment by Rep. Andrew L. Somers, Democrat, New York, chairman of the committee. "Mr. Simpson," said Mr. Somers, "has guessed so much about the rubber situation that he may hit it right with one of his guesses." Apparently the additional confusion on the rubber situation resulting from Mr. Simpson's guesses is overlooked in the wild hope that he may "hit it right" somewhere along the line. In the words of Gilbert and Sullivan, "Here's a Pretty Mess."

CURRENT NEWS OF THE MONTH

REPORT OF THE SENATE'S TRUMAN COMMITTEE FEATURES MONTH OF ACTIVITY ON SITUATION

THE past month in the rubber field has been as hectic as the last few months, ever since the first rubber restrictions were laid down and the synthetic rubber program launched. The report of the Senate committee investigating the national defense situation, which has been probing into the entire rubber situation, was made; several new Congressional investigations were launched; new legislation on rubber was introduced; a nation-wide scrap rubber program was announced; amendments to the regulation orders were issued; the synthetic rubber program was stepped up; progress was reported on the development of American guayule—all this, and many other events affecting the rubber industry, occurred within the past month.

After studying the rubber situation for a period of several months, the Senate committee, headed by Senator Harry Truman, of Missouri, which has been investigating the national defense program, rendered its report to the Senate on May 26. Although there was no assurance, the report concluded, that the synthetic rubber program now under way was the right one or would prove to be workable, dependence for future rubber supplies is almost entirely on the development of that program.

Committee's Report Is Blunt

In dealing in "hindsight," the committee was blunt in citing instances of what it declared to be a lack of foresight as the rubber situation developed from plenty to the present scarcity. Even the U. S. Army was criticized sharply for alleged careless use of its tires and was admonished to conserve its supply just as the civilian was being forced to do. If the synthetic rubber program did not measure up to expectations, the Army itself might find itself out of rubber some day, the committee warned.

While the committee said that its report was one of "fact-finding" and not "fault-finding," the 57-page report submitted and explained by Senator Truman, put blame on American officials and agencies, the automobile industry, and the British and Netherlands interests controlling world supplies. A lack of centralized authority was blamed for the synthetic rubber situation.

One section of the report dealt with the agreement, made in 1929, between the Standard Oil Company of New Jersey and I. G. Farbenindustrie of Germany, in which the committee concurred in findings by the Justice Department's anti-trust division that this "cartel" had "hampered" the development of synthetic rubber in this country and had worked to the advantage of the Axis nations.

Although junk heaps hid "a greater wealth of rubber than our enemies could assemble from all sources available to them today," the committee said, the lack of a scrap collection program had further handicapped the present production efforts. The group recommended early action in this regard and suggested taxation as a penalty for the hoarding or withholding of scrap beyond deadlines.

There were now 1,000,000 tons of rubber on the wheels of motor vehicles in this country, constituting "the biggest stockpile in the world," the committee declared. But, it added, for every day that "driving as usual" continued, 600 tons of rubber were lost.

Stockpiles of crude rubber were depleted as late as last year by "an orgy of consumption" that went on unchecked by Federal agencies, during a period when all the government agencies involved and the rubber industries were "fully aware of the threat to supplies in the Far East, and were attempting to devise means to safeguard themselves against it," the statement charged.

"This loss of vital stocks," the committee reported, "might have been prevented had there been a centralized authority to deal with the situation, or if the Office of Production Management (which preceded the W.P.B.) had curtailed automobile production.

"But at the very period when it became clear that some action was necessary to conserve rubber the companies indulged in an orgy of consumption, laying in stocks of finished goods at a rate which reached, in June, 1941, a new high of over 1,000,000 tons per year."

This, the committee said, came also at a time when the stockpiles of the country should have been built up faster and more steadily than was being done.

Our stockpiles had been held down, the committee declared, because 97 per cent of the world supply of crude rubber, under control of British and Netherlands interests—operating, the report said, in the nature of an international cartel "even after Dunkerque"—objected to relaxing the United States quota as they "feared that if the emergency failed to materialize, excess stocks of rubber in the United States would enable the United States to control market prices."

"Only after Mr. Jones (Jesse H. Jones, Secretary of Commerce and Federal Loan Administrator) agreed on Nov. 4, 1940, to provisions which would avoid a sudden glutting of the market," the report stated, "did Sir John Hay (representative of the International Rubber Regulation Committee) recommend that the quota be increased.

"On Nov. 29, 1940, it was increased so as to permit production up to 100 per cent of capacity."

After this, the committee stated, there came the "orgy of consumption" which the government did not check.

Meanwhile, in the first six months of 1941, the committee asserted, the country's stockpile received only 70,000 tons of crude.

War Department Answers Criticism

In answer to the criticism of its actions made in the Truman report, which suggested carelessness in its use of rubber while the civilian population was put on rationing, the War Department, through testimony presented before the House Committee on Interstate Commerce on May 29 by Major John S. Burgess, Jr., asserted that with only one of its conservation measures it would save an estimated 50,000 tons of rubber during the next two years.

Major Burgess said that Army directives for rigid conservation of tires and tubes, accounting for 70% of the total service use of rubber, were issued in January. Under these directives, he said, the number of tire sizes was reduced and steps taken for recapping and retreading not only at camps and posts but in the field. He also outlined a number of other conservation steps taken, stressing the point that the Army started several of these steps "six months before Pearl Harbor."

Denial that the Anglo-Dutch rubber combine had prevented the faster accumulation of an emergency stockpile or had in any way interfered with the synthetic rubber program was issued by the Netherlands Information Bureau on June 12. Profits from rubber were not excessive, the Bureau stated, and both Dutch and American plantation interests in the Netherlands Indies were "taxed to capacity" for arming the country. Dollar proceeds from the sale of rubber, it added, were used to place armament orders in the United States.

Roosevelt Expresses Optimism

President Roosevelt stirred up a little excitement when he expressed the opinion at a press conference on May 26 that he did not think there was anything in the rubber situation to cause excitement. He thought, he said, that everything would work out all right. Work, he disclosed, was under way on two or three different kinds of tires which did not contain rubber and would permit speeds of 30 or 35 miles an hour. Although urged, he would go no further in his statements.

It is believed that the President had reference to the work being done by several of the rubber companies along the lines of a "rubberless" tire. Goodyear, some two months ago, announced that it was conducting experiments on such a tire while Ford announced that it was working on a tire that would have very little rubber. It is also believed that he may have had reference to the progress being made by the special committee of the War Engineering Board.

This special committee, composed of members from the tire and automotive fields, is headed by James G. Zeder, chief engineer in charge of laboratories for the Chrysler Corp. For the past several weeks it has been exploring all possible sources of relief for the impending tire shortage and it is understood that both tire and automotive companies have pooled all their information from many years of experimentation in rubber substitutes.

The committee's objective, according to a spokesman for the industries represented on it, is to do something quickly to meet essential transportation needs. Therefore, the present search is mainly for a retreading substance. An almost endless variety of substances has been considered, according to the spokesman, including linseed oil, asphalt, pitch, oils, glues, casein and soy beans. Wooden or cushion wheels have been considered and ruled out as providing no solution. Although it was emphasized that the solution "was not around the corner," hope was expressed that a fairly satisfactory substitute material would soon be announced.

A major tire manufacturer is expected to make an announcement shortly of an "overshoe" for tire casings to preserve the rubber in present tires. Made chiefly of cotton, the "overshoe" is believed to contain no strategic materials and will last from 2,500 to 10,000 miles.

Joint Warning is Issued

In an effort to clarify the facts about the severe rubber shortage four leading war agency officials joined in a statement issued on May 22. The statement stressed the fact that the rubber shortage is extremely serious, reports to the contrary notwithstanding, and that no rubber of any kind can be spared for purposes not directly connected with the war effort. The officials were Donald M. Nelson, chairman of W.P.B.; Arthur Newhall, Rubber Coordinator; Joseph B. Eastman, director of O.D.T.; and Leon Henderson, O.P.A. Administrator and head of W.P.B.'s Division of Civilian Supply.

The statement reviewed the entire situation briefly leading to the necessity for strict rationing, pointed out that some 300,000 tons of synthetic rubber will be produced in 1943, urged everyone to turn in their scrap rubber, indicated that four to six years will be required before guayule rubber grown in the United States can make an appreciable contribution to the supply and that not more than 10,000 tons annually can be expected soon from Mexican guayule, and expressed the belief that we will get from 10,000 to 15,000 tons this year from Brazil and perhaps 25,000 to 30,000 tons in 1943.

Expanding on the statement in a press conference following its issuance, Mr. Newhall stated that there should be enough rubber available in the tires of existing automobiles for essential driving for two years. However, he added, if the American people did not conserve this transportation potential, it might be necessary to transfer civilian passenger cars to communities where they were needed. As an example, it was estimated that 12,000 cars would be required for transportation of workers at the new Ford bomber plant at Willow Run.

Requisitioning of several million private automobiles by the government next year was forecast by the Brookings Institution in a statement issued on May 22 based on a special automobile transportation survey. The necessity for this action was foreseen despite drastic gasoline rationing and all efforts to produce synthetic rubber. According to the survey, it seems highly improbable that the projected synthetic rubber plant capacity can be made to produce enough rubber to meet both military demands and essential civilian requirements.

The report estimated that if normal driving habits continue the supply of tires will not be sufficient to meet essential requirements by the middle of 1943 and will be completely exhausted by 1945. These estimates are based on a calculation that 20,000,000 passenger cars are needed to maintain the civilian economy without serious disruption.

Amendments to Rubber Orders

Two new amendments have been issued to the rubber restriction orders since our last issue, both of which were announced just before this issue went to press and both of which will be reproduced in full in the next issue.

On the recommendation of the Board of Economic Warfare, W.P.B. issued Amendment No. 10 to Supplementary Order No. M-15-b on June 5, prohibiting the importation of rubber and rubber products, including balata, except by the military forces or by subsidiaries of the R.F.C. The Rubber Reserve Co., which has heretofore been the sole importer of crude rubber and latex, will now also undertake the purchasing of reclaimed and scrap rubber in any form, as well as finished rubber products.

Amendment No. 6 to Supplementary Order No. M-15-b-1, issued by W.P.B. on June 12, requires the use of more reclaim and less crude in the manufacture of industrial pneumatic and solid tires. This is expected to save from 75 to 100 tons of crude each year without materially diminishing quality. The amendment also establishes specifications for the manufacture of rubber insulating tape which are designed to save an additional 200 tons of crude a year.

The use of bare rubber thread, and of covered rubber thread of size 60 and coarser, was prohibited by W.P.B. in the manufacture of a list of health and medical products. The prohibition was contained in Amendment No. 3 to Conservation Order No. M-124, issued on May 26. Covered rubber thread, size 61 and finer, however, may continue to be used in such products.

Products affected by the amendment include edging, industrial shoes, belting and flexible metallic hose, repair cords and webs, sanitary belts, surgical elastic bandage, surgical stockings, trusses, webbing for respirators, hose masks, gas masks and inhalators, and surgical supports for abdomen, back and breast.

Rubber yarn, latex yarn, or elastic thread for use in these products were previously exempt from the restrictions of the conservation order. The new amendment limits this exemption to covered rubber yarn, covered latex yarn, or covered elastic thread of size 61 or finer.

Sales and purchases of rubber life-saving suits were restricted on June 1 by issuance of Supplementary Order M-15-e. The order, issued to make the necessary equipment available for ocean-going and coastwise cargo and tank vessels of over 1,000 gross tons, provides that the suits can be sold only for uses prescribed by the Coast Guard or if the sale has been expressly authorized by the Director of Industry Operations of W.P.B. Purchases made by or for the account of the Army, Navy, Coast Guard, or for Lend-Lease purposes are exempted from the restrictions. The Coast Guard recently issued regulations requiring that cargo and tank boats of the kind mentioned in the order be equipped with one life-saving suit for each person on board.

Latest Price Orders

The anticipated order establishing ceilings on manufacturers' prices for standard mechanical rubber goods items was issued by O.P.A. on May 22. The ceilings, as well as a formula for computing maximum prices on specially designed items, are contained in Maximum Price Regulation No. 149, which became effective on May 27. Issuance of the ceiling order followed a series of conferences with small and large mechanical goods manufacturers. The order, together with a statement of considerations explaining the method used to determine ceilings on standard goods and the formula for computing specification products, will be found on page 215 in this issue.

Taking into consideration special circumstances surrounding the production of many military articles, Price Administrator Henderson on June 4 announced a method for pricing such items that may be sold or delivered to war procurement agencies after July 1. The method, incorporated in Maximum Price Regulation No. 157, establishes maximum prices for several commodities when made in accordance with military specifications, including rubber fabrics, apparel and footwear, and wearing apparel, including findings, and other individual, organizational, or ship's personnel equipment made in whole or in part from rubber, except rubber drug sundries.

Maximum prices are established at the highest price at which sale or delivery of a particular article was made prior to April 1, 1942, plus an amount proportionate to the seller's increases in material and labor costs between the time the contract was placed and March 31, 1942, plus increases in wage rates pursuant to certain collective bargaining contracts or other wage agreements entered into before April 27, 1942. No further increase in costs beyond the dates specified will be allowed, it was stated.

Sales of waterproof rubber footwear under contract with any war procurement agency or with anyone who buys for resale to such an agency were specifically exempted from Maximum Price Regulation No. 132 by an amendment to that regulation issued by O.P.A. on June 7. It was pointed out, however, that the sales exempt from the rubber footwear order are subject to Maximum Price Regulation No. 157, discussed above.

Suggestions on Camelback

In an attempt to provide recapped passenger car tires that will travel as much as 10,000 miles and give motorists two years' service under wartime driving restrictions, the Standards Section of the Consumer Division of O.P.A. announced on May 12 that it had released to camelback manufacturers suggestions outlining the average properties of the industry's product so that each maker of camelback can bring his own brand up to the industry level.

Auto tires recapped with some of the better grades of reclaimed rubber now being produced, the division pointed out, may last through as much as 10,000 miles of city driving, and if auto travel is cut 50% by wartime measures this means that tires will last two years or more. Local tire rationing boards may permit drivers to have their tires recapped if they can show definite need bearing on the war effort.

W.P.B. has specified two kinds of camelback to date, Grade C for truck tires, which can be made with restricted amounts of crude rubber, and Grade F for passenger car tires, which must be made wholly of reclaimed rubber.

On June 2 O.P.A. issued a statement to the effect that the serious rubber situation necessitates immediate steps to eliminate careless workmanship in the recapping of tires and to arrange for technical advice for retreaders who are not skilled in applying the new camelback made almost entirely of reclaimed rubber. It is understood that local rationing boards have been receiving complaints on the quality of work done by some recappers and retreaders. In a letter to all O.P.A. state directors, Deputy Administrator John E. Hamm requested that these officials ask local boards for reports of names and addresses of retreaders against whom there have been an apparently excessive number of consumer complaints. The letter suggested that where possible the name of the camelback supplier be furnished.

New Legislation Introduced

Companion bills designed to keep serviceable tires on 20,000,000 automobiles for the duration of the war with the use of only 3,500 tons of crude rubber from the stockpile, said to be about 750,000 tons, were introduced in the Senate by Senator Ellender (Dem., La.) and in the House by Representative Patman (Dem., Texas) on June 1. Senator Ellender is chairman of a subcommittee of the Senate Small Business Committee and Representative Patman is chairman of the House Small Business Committee.

The bills were said to be the result of three months of study and hearings and to be based on the fact that tires can be retreaded with reclaimed rubber under new processes recently developed by tire manufacturers and retreaders with the use of a maximum of two ounces of crude rubber per tire.

The legislation provides that under direction of a deputy price administrator, the whole tire situation shall be surveyed, and that all tires shall be inspected at regular intervals by independent tire dealers. In this way, legislators claim, the need in any case for recapped tires can be determined. It is estimated that the retreading or recapping of 30,000,000 tires per year, as provided in the plan, will keep 20,000,000 cars in usable condition.

The committees emphasize that there is a shortage not only of crude rubber but of scrap and reclaimed rubber. The legislation requires that in order for the automobile owner to secure a tire, casing or tube, he shall deliver, at the time of his purchase, a used tire, casing or tube. In addition, Rubber Reserve Corporation shall, to the fullest practicable extent, acquire all the scrap rubber which is in the stocks of dealers, at the maximum price now in effect. After sixty days manufacturers using scrap rubber would be permitted to buy it for any price.

The legislation provides that all restrictions except in regard to price and periodic inspection are to be lifted on the sale of odd-sized tires 17 to 21 inches, obsolete types and substandard grades, to a broad list of essential civilian and war production users of motor cars. Among such users are persons employed in war defense plants, farmers living on farms, dealers in used cars, and traveling salesmen.

By providing that inspection and sale of tires and tubes and recapping services shall be in the hands of independent tire dealers, the legislation proposes to keep and maintain thousands of tire dealers and service stations which are essential to the transportation system of the country.

In hearings on the bill pending in the Senate, Senator Ellender told the Senate Banking Committee on June 9 that only 85,000 tons of reclaimed rubber would be required to keep at least 20,000,000 cars operating. The 3,500 tons of crude, he said, was but a fraction of one per cent of the stockpile and was needed "as an adhesive to bind the reclaimed rubber to the tire carcass." J. Penfield Seiberling, president of the Seiberling Rubber Co., expressed general approval of the bill but protested that its definition of independent tire dealers who would be given sole authority for inspection, sales and recapping of tires was "too broad."

Opposition to the bill was voiced on June 11 by Under-Secretary of War Robert Patterson. The Under-Secretary told the Small Business Committee that the Army will need 800,000 tons of rubber between now and December 31, 1943, and that use of rubber for civilian purposes not strictly essential should be curtailed. He balanced the 800,000-ton military need against estimates of a 600,000-ton crude rubber stockpile, 500,000 to 800,000 tons of collectible scrap, and the 1,000,000 tons of rubber tires now on the highway.

Legislation designed to compel the Price Control Administrator to conduct a thorough investigation into the possibility of reclaiming rubber in sufficient quantities to make it available for civilian use was introduced to the Senate by Senator Edwin C. Johnson (Dem., Colo.) on June 4.

Protest Simpson Appointment

The House Committee on Coinage, Weights and Measures, which has been holding hearings on a bill by Representative Faddis (Dem., Penna.) proposing to earmark $250,000,000 from the government's stabilization fund for the purchase of crude rubber, on June 10 appointed Elliot E. Simpson, self-styled independent rubber dealer of New York City, said to be associated with the L. Drexsage Co., as its non-salaried counsel. Mr. Simpson has appeared before various Congressional committees in recent weeks alleging that the rubber shortage is a "myth" and a "fake." His claims have been termed "completely ridiculous" by several members of the industry.

Mr. Simpson's appointment drew emphatic protests from the trade. In a telegram to Representative Somers (Dem., N. Y.), chairman of the committee and who appointed Mr. Simpson, the Rubber Trade Association of New York, composed of the country's leading dealers, challenged Mr. Simpson's description of himself as "the country's most thorough rubber expert" with the flat assertion that he "is not qualified for this post." Other protests have been lodged with the committee.

CONGRESSIONAL COMMITTEES CONTINUE INVESTIGATIONS ON SYNTHETIC

Turbulent sessions continued to mark the hearings conducted by the Senate's agricultural sub-committee investigating the use of grains and other farm products in the production of synthetic rubber and alcohol. The sub-committee is headed by Senator Gillette.

Charges were made before the committee that the petroleum industry was injuring the war effort by keeping a closed door against the possible production of alcohol from grains for the manufacture of butadiene needed in the production of synthetic rubber. The question of cost was raised constantly.

Cy Neuman, president of the Publicker Commercial Alcohol Co. of Philadelphia, sponsor of Waclaw Szukiewicz, the Polish chemist who aided in the development and manufacture of Ker in Poland before the war, testified that plants to make butadiene from alcohol could be built in one-third the time it takes to build one to make it from petroleum. He added that Dr. E. R. Weidlein, of Mellon Institute, now serving as a technical consultant on synthetic rubber to the Rubber Reserve Co., had indicated it would take less material per plant.

The question of materials was also under discussion. According to Co-ordinator Arthur B. Newhall and others it would take about 300 miles of copper tubing to build alcohol plants capable of making 82,000 tons of butadiene a year, but the need for copper was disputed by H. Fred Willkie, brother of Wendell P. Willkie, in his capacity as vice-president of Joseph F. Seagram & Sons Co. of Louisville, Ky. According to Mr. Willkie, "you don't even have to use any copper in distilleries which make 190 proof alcohol for the manufacture of products and butadiene synthetic rubber . . . you can use any kind of metal—silver, steel; even wood or sewer pipe if necessary."

W.P.B. Estimates Challenged

In answer to a statement from W.P.B., based on a report from its chemical division, to the effect that plants turning out 10,000,000 gallons of alcohol a year would involve the diversion of 5,360 tons of steel and 296 tons of copper and copper alloy, Leo M. Christensen, who is connected with the Nebraska Chemurgy Project, testified that such plants could be constructed with the use, at most, of 360 tons of steel and 90 tons of copper and copper alloy. He expressed considerable surprise at the size of the W.P.B. estimates.

Dr. Earl N. Bressman, an agricultural expert, also told the committee that plants for the production of butadiene from alcohol can be built more quickly and with the use of fewer critical materials than similar plants for use with petroleum. Dr. Bressman is director of the agricultural division of the Office of the Coordinator of Inter-American Affairs.

Representative Carl T. Curtis, Republican, Nebraska, is another who appeared before the committee with the allegation that alcohol-butadiene plants cost less to construct. He said that construction of a large enough plant would "necessitate the use of approximately 375 tons of steel, a few tons of copper, and a little silver." He charged Donald Nelson and Jesse Jones with "flatly and defiantly" refusing to permit the use of farm commodities in producing synthetic rubber, and issued a direct challenge to them "to release and make available sufficient steel, copper and other materials for the construction and equipment of at least one alcohol and rubber plant."

The claim that butadiene for synthetic rubber could be made from grains or other surplus farm products at a cost of only 5 cents a pound against a cost of 24 cents a pound from petroleum was made in testimony given by Dr. William J. Hale, president of the National Agrol Co. Dr. Hale, too, accused the petroleum companies of working a monopoly in connection with the current synthetic rubber program, placing a "taboo" on grain alcohol. This charge has been specifically denied by several of the oil companies involved.

Some Light Shed on Situation

Some light was shed on the situation on May 21 when Jesse Jones reappeared before the committee and stated that at least 1,000,000 tons of synthetic rubber annually by 1944 was under consideration, including large proportions of rubber made from butadiene received from grain alcohol. Stating that he was in complete sympathy with the purpose of using as much grain alcohol in the manufacture of rubber "as is consistent with the use of critical materials," Mr. Jones revealed that the Carbide & Carbon contract calls for 80,000 tons of synthetic rubber from alcohol, although the contract did not provide specifications as to how the alcohol should be made. He added, however, that 54,000,000 gallons of grain alcohol would be used.

At the same hearing, Mr. Jones told the committee that the synthetic rubber program includes the construction of plants scattered well over the country, but located principally near oil refineries and particularly near oil pipe lines. Most of the plants, he said, are being built in California, Texas, Louisiana and Indiana. By the end of 1942, he testified, we should have 100,000 tons capacity in operation, and by July, 1943, 250,000 to 300,000 tons. By the end of 1943, he added, all of the plants should be completed. The plants mentioned cover not only processing plants, but those which will provide the raw materials, particularly butadiene and styrene.

According to the best information obtainable, it now seems definite that 200,000,000 gallons of alcohol derived from grain in 1942 will be allocated to the production of butadiene for synthetic rubber. According to a report made on May 24 by A. I. Henderson, newly-appointed director of materials for W.P.B., military and essential civilian demand for 1943 is estimated at 476,000,000 gallons, including the 200,000,000 gallons for butadiene.

Production capacity is estimated at 540,000,000 gallons, to which will be added a stockpile of 50,000,000 gallons plus, surplus from 1942. The production capacity will be achieved by conversion of the whiskey distilling industry to industrial alcohol and full-time operation of all industrial alcohol plants in the country. (See chart). Conversion of plants is in keeping with the government program to convert rather than construct new facilities wherever and whenever possible.

Further information on the amount of synthetic rubber to be made from alcohol-butadiene came from Rubber Co-ordinator Newhall. Appearing before the committee on June 9, Mr. Newhall said that the latest revised program calls for the production of 230,000 tons of rubber from alcohol. This production, he said, would be allocated among four government-owned plants, as follows: Charleston, W. Va., 85,000 tons; Naugatuck, Conn., 25,000 tons; Cincinnati, 40,000 tons; and Louisville, 60,000 tons. He stated that he was not much concerned about the source of the alcohol necessary, although he did not express much enthusiasm about a rubber-from-grains industry.

Additional Witnesses Heard

Other witnesses appearing in recent weeks before Senator Gillette's committee included Clarence R. Bitting, president of the United States Sugar Corp., who testified that an official of the Rubber Reserve Co. had advised a representative of his company against proceeding with plans for the production of synthetic rubber from sweet potatoes and sugar cane, and Daniel Pyzel, vice-president of the Shell Union Corp., who admitted under examination that Shell Chemical, a subsidiary, was producing only 10 tons of butadiene a day in a plant which began operations several months ago and that plants now projected under

the current synthetic rubber program might become "completely useless" after the war unless synthetic rubber could be produced at a cheaper cost than the natural product. According to Mr. Bitting, if he were granted a priority rating on an electric turbine generator he could begin his projected synthetic rubber program within nine months and produce from 80,000 to 100,000 tons of synthetic rubber from butadiene within one year.

Members of the Senate's agricultural subcommittee are understood to be pressing for legislation which would establish an independent agency to deal with the production of rubber from alcohol based on grain. Senator Gillette recently stated that such an agency should be established "to by-pass W.P.B. officials hostile to producing such commodities from grain. There is room for every possible source of industrial alcohol and rubber in the current picture."

According to testimony from Thurman Arnold, five companies produce nearly 80% of industrial alcohol in the United States, based on figures for the fiscal year of 1940-41, these being: Carbide & Carbon Chemical Corp., 20%; Publicker Commercial Alcohol Corp., 18%; U. S. Industrial Alcohol Corp., 17%; DuPont, 13%; and Commercial Solvents Corp., 12%.

Plants Get Into Production

While arguments raged in Washington on the alcohol-butadiene problem, word was received from Akron that the first batch of Buna S had been turned out at the government-sponsored plant built by Firestone and that combat tires made of this synthetic had been made and were undergoing tests. A few days later, a similar plant built by Goodyear went into operation. These are the first two of the government-sponsored plants to get into production. Both plants were put under construction about one year ago, and each has a potential capacity of 15,000 tons. Additional units, also of 15,000-ton capacity, are under construction by both companies.

Progress in the manufacture of synthetic rubber on a commercial scale was reported by both Goodyear and Goodrich in summaries released on May 23 by the Truman Committee. Goodyear, after recounting its expanded operations in synthetic, declared that the "bottleneck of the government program has been, and is today, the production of butadiene." Lack of this material, it added, would have made any large expansion of private rubber plants worthless. The Goodrich summary indicated that leading rubber companies now have the "know how" to make passenger car tires entirely of synthetic rubber except for one ounce of the natural product in each tire. This single ounce goes into the bead. Previously, so-termed synthetic rubber tires had approximately 40% of crude and it is known that early all-synthetic tires failed miserably. Goodrich also revealed that its privately operated Hycar plant was now producing close to its capacity of 7,000 tons per year.

Some information concerning the construction of rubber-producing plants under the gigantic government program has also come to light. P. J. Bukowsky, chief examiner of the Chicago district for the R.F.C., announced construction of a $50,000,000 plant to cover 100 acres in West Gary, Indiana, to begin immediately. The plant, he said, would be operated by Rubber Synthetics, Inc., a new corporation formed by Standard Oil of Indiana, Sinclair, Cities Service, Dow Chemical, U. S. Rubber and Firestone. It is believed that the plant will consist of a number of units including those producing butadiene and those manufacturing Buna S.

According to a statement from the Humble Oil & Refining Co., made on June 3 at Houston, Texas, that company will construct a plant in Texas for the manufacture of Butyl rubber. The plant will cost approximately $16,000,000, will be built with government funds, and then leased for operation by the oil company. Humble Oil will also operate a plant for producing butadiene under the government program.

It is also believed that Joseph E. Seagram & Sons Co. is planning the construction of a pilot plant at Louisville, adjoining its two distilleries, for the production of butadiene rubber. The plant, as contemplated, will have a capacity of about 4,000 pounds a day. The company, it is believed, will handle full details, making the butadiene from grain alcohol and then preparing the rubber.

New Butadiene Process Developed

Of considerable interest during the month was the announcement by W. S. Farish, president of the Standard Oil Co. of New Jersey, of the development of a new procedure for operating fluid catalytic and alkylation oil refining units by which butadiene and 100 octane gas (aviation fuel) can be produced simultaneously and with greater flexibility than under present methods.

Mr. Farish estimated that adoption of the new method will speed up the war program for production of synthetic rubber from plants already underway and will provide the nation with an increased potential capacity of raw material for more than 400,000 tons of Buna S and 240,000 tons of Butyl rubber a year.

Synthetic rubber raw materials, he said, can be produced in plants now under construction by refiners for the production of greatly increased quantities of 100-octane aviation gasoline. Portions of these plants, several of which will be operated by Standard Oil, being built at a cost of $120,000,000 can, with the new procedure, perform a dual role by turning out the expected production of 100-octane gasoline and, at the same time, produce raw materials for synthetic rubber. A prime bottleneck in the government's synthetic rubber program has been the construction of plants to produce the raw materials.

All details of the process, based on experimental plant experience, have been supplied to the Petroleum Coordinator and other government agencies, Mr. Farish said, adding that the new method will be generally available under the system of licenses now being used in the oil industry. This system has the approval of the Petroleum Coordinator.

Additional Charges Are Filed

Additional charges against the Standard Oil Co. of New Jersey with relation to its pre-war contract with I.G. Farbenindustrie of Germany were filed in recent weeks. Appearing before the Senate committee on patents, which is studying legislation to establish a licensing system for patents needed in wartime production, Robert M. Hunter, of the anti-trust division of the Department of Justice, charged on May 20 that by "mishandling the synthetic rubber program" Standard Oil "had done a grave injustice to the nation."

Mr. Hunter claimed that Standard Oil through its cartel arrangement with Farbenindustrie deliberately delayed production of the Butyl rubber process developed in its own laboratories. He said that although Butyl is "the cheapest, and most easily produced of any of the synthetic rubbers, not a pound of it has been produced for commercial use in this country to date." He also alleged that Standard Oil "attempted to force government financing for a large scale buna program, intending to reserve its own investment for Butyl which it was sure had greater possibilities."

Testifying that Standard's own production figure for the output of buna at the rate of 109,000 tons per year was 17.6 cents a pound, and 8.23 cents a pound for Butyl at the same rate, Mr. Hunter explained that the charges were based on a study of thousands of documents taken in February from the files of the oil company and those of Chemnyco, Inc., which he said was the New York representative of I.G. Farbenindustrie.

Charges that Standard Oil has "covered up" and "distorted facts" in its rebuttal to charges that the company's cartel arrangement with Farbenindustrie had hampered the development of synthetic rubber in the United States were made by Thurman Arnold, Assistant Attorney General, on May 31. Mr. Arnold brought the original charges against the company.

Standard Oil, said Mr. Arnold, attempted to cover up and mislead the investigating (Truman) committee on several matters, including the information it received from Farbenindustrie on buna, the information it gave the government on synthetic rubber, its alleged failure to disclose to the State Department Farbenindustrie's "control over synthetic rubber," its "deliberate effort to frustrate the development of a synthetic rubber program in this country" unless it was "allowed to dominate it," and its "continuing relationship" with the German company.

Mr. Arnold's latest charges were made in a statement given to the Senate patents committee. As in his previous testimony on the situation, however, he re-emphasized the point that in his belief "there is no alliance with German interests from unpatriotic motives." "The sole motive," he declared, "was an attempt on the part of Standard Oil to get a protected market, to eliminate independent competition, and, finally, to restrict world production in order to maintain that protection."

Despite these renewed attacks by government officials, stockholders of Standard Oil, meeting in Flemington, N. J., on June 2, adopted a resolution expressing complete confidence in the management of the company. The resolution of confidence was proposed by James W. Gerard, who was Ambassador to Germany in the last war. Mr. Gerard likened Standard Oil to a scapegoat and said that Thurman Arnold had misled the Department of Justice in regard to Standard's relations with Farbenindustrie and also to its program for manufacturing synthetic rubber.

W. S. Farish, president of the company, revealed that he had written a letter to Washington officials in answer to the latest charges made by Mr. Arnold. He repeated his earlier assertions that the pre-war contracts with Farbenindustrie had reacted to the good of the country since out of these contracts came 100-octane gas, synthetic toluol, American control of buna processes and processes for production of butadiene, Vistanex, and Butyl rubber. He offered to file a documented review of the matters raised in Mr. Arnold's latest brief "if the national interest requires any further examination of this whole matter."

New Materials Still Sought

Little further has been heard concerning the substitute rubber developed by Dr. Glenn L. Casto, a dentist of Spencer, West Virginia, which received wide publicity early last month. It was learned, however, that a charter has been issued by West Virginia to the Casto Rubber Co. Incorporated by Dr. Casto, Guy Flesher and C. S. Dodd, all of Spencer, the company is capitalized at $20,000. Dr. Casto was graduated from Ohio State University in 1935.

According to Dr. Casto his substitute rubber, which he emphasizes is not a synthetic rubber, uses principally natural gas, coal, wood and grain. Arrangements are understood to have been completed for the construction of a pilot plant in West Virginia and it is believed that the plant would soon be turning out "several thousand pounds a day."

In one interview, Dr. Casto stated that "so far as we know, the rubber substitute will not mix satisfactorily with crude rubber, with reclaimed rubber, nor with any of the commonly known synthetics, unless the synthetics are vulcanized and ground and the rubber substitute used as the binding material." Tires retreaded with the Casto material are reported to be giving good service.

According to Gustav Weber, an industrial chemist of Miami, Florida, the gum of the southern pine can be converted into a synthetic rubber of high quality, suitable for both new tires and retreading, for less than 32 cents a pound. He said that a plant capable of producing 9 to 12 tons of synthetic rubber latex per day could be erected in 90 days at a cost of only $200,000, and suggested that five such plants could be erected in the Naval Stores area of the south.

This synthetic material, according to Mr. Weber, is made of pine gum, sand, saw grass, magnesium and minute quantities of several chemicals. It is said to be as hard, as light and as tough as duraluminum. The material cannot be considered a plastic, Mr. Weber said, since it is processed without heat, the cold mixture being spread over a form, hardening in 8 to 12 hours. The process is said to be under consideration by W.P.B.

Some consideration is also being given to a new process developed by J. W. Jean, inventor of Altadena, California. Mr. Jean is reported to have produced a new type of synthetic rubber as a by-product of a synthetic gasoline process which, too, is receiving considerable attention. Little is yet known of this process, but it is reported that the synthetic material has as much "bounce" to it as has crude rubber.

A process for the manufacture of synthetic rubber from Berea oil has been developed by William E. Bartoe, of Gore, Ohio. According to Mr. Bartoe one 44 gallon drum of Berea oil would produce more than 175 pounds of synthetic rubber at small cost.

Retreading of passenger tires at the rate of a million tires per month by the end of 1942 may be possible through the use of a new Thiokol-type rubber, according to a statement by the Dow Chemical Co. made on May 31. The new material, developed by Dow chemists, according to the statement, in conjunction with the Thiokol Corp., for which it now produces Thiokol, is said to have a tensile nearly as great as that of rubber and to be far more resistant to solvent or oil action.

Thiokol is not among the synthetic rubbers now undergoing rapid development in the government's 800,00 to 1,000,000 ton synthetic rubber program. Accordingly, since Thiokol can be made from available chemicals, W.P.B. is not expected to interpose any objections to plans to retread civilian tires with the new material. On June 6, in fact, W.P.B. officials said that the R.F.C. had issued a "letter of intent" to Dow Chemical covering the production of an unstated amount of the new Thiokol-type material. Dr. Willard H. Dow, president of the company, was recently in Washington negotiating for production of about 60,000 tons of the new material.

Some criticism was levelled at the Rubber Reserve Co. early this month by "high officials of W.P.B.," according to newspaper reports, for failure of that agency to give sympathetic consideration to a Russian-devised process for the manufacture of synthetic rubber. Rubber Reserve, it was said, could have the Russian patents for the asking and, it was charged, the Russian government has offered to send technical experts to this country to give the United States the benefit of their research experience. Rubber Reserve officials, however, answered the charges with the statement that full consideration had been given to the Russian process, which is based on butadiene but which substitutes metallic sodium for styrene or acrylonitrile, but for technical reasons was proceeding on its previous decisions.

The first batch of Chemigum made in the new government-sponsored addition to Goodyear's plant in Akron is seen rolling off the production line in this photograph. This addition started in operation on May 20. Another government-sponsored addition is scheduled for completion later this year. One addition at the Firestone plant in Akron has also been put into operation under the government program for synthetic rubber production.

Price Ceilings Removed

Price ceilings on synthetic rubber were removed on June 13 by O.P.A. through issuance of Amendment No. 7 to Supplementary Regulation No. 1 to the General Maximum Price Regulation. The amendment was made after other government agencies had asked for the exemption to further increased production of the commodity. The price ceilings were removed, it was explained, to permit complete price flexibility during the formative stages of industry expansion to meet critical wartime needs. Price ceilings on aviation gasoline and toluene were removed at the same time.

The amendment to Supplementary Regulation No. 1 declares that the General Maximum Price Regulation shall not apply to any sale or delivery of "synthetic rubber, including rubber of the butadiene-styrene copolymer, Perbunan, neoprene, Thiokol, Butyl, Koroseal, Flamenol and acrysol types" nor to certain materials entering into the production of these synthetics including "components of synthetic rubbers, including but not limited to butadiene and styrene; all hydrocarbons and petroleum fractions used in the manufacture of butadiene and styrene, including but not limited to ethylene, propylene, butylene, iso-butylene, propane, butane and iso-butane; hydrogen, acetaldehyde, acetylene, vinylacetylene, vinyl chloride, vinyl acetate, sebacate esters, phthalate esters, tricresyl phosphate, hydrochloric acid, calcium carbide, ethylene dichloride, dichlorethyl ether, sodium polysulphide, butylene glycol, and acrylonitrile."

Raw Materials Under Allocation

To insure delivery of needed amounts of styrene to synthetic rubber plants without prohibiting the use of surplus styrene in the manufacture of plastics, that material was placed under complete allocation control on June 1 by W.P.B. Under the order—General Preference Order No. M-170—producers must submit monthly delivery schedules to W.P.B. which will approve or change such schedules. It was pointed out that since styrene is not storable, there is no need to restrict its use to the manufacture of synthetic rubber at present.

Acrylonitrile, used in the production of the Buna N type of rubber, has also been placed under complete allocation control. General Preference Order No. M-153, issued on May 14 by W.P.B., prohibits the delivery of acrylonitrile in any amount except upon specific authorization of the Director of Industry Operations. It is made by only three companies and while supplies at present are adequate allocation was considered necessary to prevent dislocation of supply and demand because of excessive forward buying or the accumulation of excessive inventories.

Benzene, too, under General Conservation Order M-137 has been placed under allocation because of the growing demand for this material in making synthetic rubber, aviation gasoline, phenol for plastics, and aniline for the high explosive tetryl. Persons seeking delivery of benzene and producers seeking to use benzene must make application to W.P.B. on Form PD-223-A. Quantities of 50 gallons or less to one person in one month are excepted.

In addition to these raw materials, several additional basic raw materials have recently been put under allocation including the following: by-product ammonia and sulphate of ammonia; synthetic ammonia; cyanamid; capryl alcohol; isopropyl alcohol; and methyl ethyl ketone. Among other uses, capryl alcohol finds application in the manufacture of certain synthetic rubbers and coating materials.

NATION-WIDE COLLECTION OF SCRAP LAUNCHED BY PRESIDENT ROOSEVELT

The long-anticipated nation-wide scrap rubber drive, the only factual answer to the nation's scrap rubber potential, was announced by President Roosevelt in a radio broadcast on June 12. The President called upon the American people to dig into their attics, cellars, barns and garages for used rubber articles of every description.

Details of the program are simple. The campaign begins on June 15 and runs through June 30. The Bureau of Industrial Conservation of W.P.B. will supervise, working in close cooperation with the Office of the Petroleum Coordinator for War and the Petroleum Industry War Council. Over 12,000 local salvage committees set up by the B.I.C. in every state will play a major role in the effort.

The public will turn over their collected scrap to the nation's 400,000-odd neighborhood gas filling stations and will be paid at the rate of one cent per pound. Oil companies servicing the stations will collect the rubber and take it to central concentration points. These companies, taking title to the rubber, will sell mixed scrap to the Rubber Reserve Co. (or to the Rubber Recovery Corp., a new R.F.C. subsidiary) at the rate of $25.00 per short ton in carload lots. The excess resulting from the difference between $20.00 a short ton paid to the public and the priced paid by the government to the oil companies will be turned over to designated charities.

The government will store the scrap in warehouses and it will later be allocated to reclaimers at the direction of W.P.B. Industrial scrap, as differentiated from scrap uncovered by private citizens, may either be sold to the oil companies at bulk distributing stations or sold through the usual trade channels. The oil companies will report their collections and their payments to the Petroleum Industry War Council so that every pound of rubber taken in through filling stations will be accounted for. A report on the total amount of rubber collected at the stations in the special campaign will be made available to the government within a short time after the close of the effort.

Stating that the drive had been decided upon because there were "as many opinions about the amount of reclaimable rubber in the country as there are experts," the President in his announcement of the drive also said that if the campaign yields "a large amount of rubber, it may be possible to protect the country's military supply of rubber, as well as help meet essential civilian needs." He stressed the point that "we know what our stockpile is, we know what our synthetic capacity will be, but we do not know how much used rubber there is in the country."

Jones Stimulates Collection

Just a few days before the official announcement of the scrap rubber drive, Jesse Jones had announced—on June 4—that in order to stimulate the collection of scrap the Rubber Reserve Co. will buy scrap rubber in carload lots anywhere in the United States at $25.00 per ton for run-of-the-mine scrap and worn out tires. The scrap, he said, will be made available to reclaimers as needed. The increased price is intended to provide small collectors throughout the country with a financial as well as patriotic incentive for putting forth greater efforts in the collection of scrap.

Basic ceiling prices for mixed passenger tire scrap now vary between $18.00 per ton at Akron and $12.00 at Memphis. Freight to these consuming centers or any one of six others whose prices are between the two levels must be borne by the seller up to an amount of $8.00 per ton. The offer of $25.00 per ton, therefore, is quite large. There is no conflict, however, between the O.P.A. ceilings and the R.F.C. offer since the former apply solely to the sale of scrap to the consumer. The ceiling order in no way conflicts with the authority of the R.F.C. to purchase all the scrap it can lay its hands on at any price it deems reasonable.

Although full details of this program —not to be confused with that announced by the President—were not yet fully available at this writing (June 15) it is presumed that it will be executed through the trade, with dealers being allowed a premium of some kind for sorting and handling the rubber. It is also believed that the R.F.C. will sell the scrap to the reclaimers at ceiling levels, thus subsidizing collection to the extent of the difference. It has often been claimed that rubber collection could be substantially increased if higher prices were paid, especially at remote points. Collection, sorting, grading and shipping generally cost more than the ceiling prices themselves.

In testimony given before the House

IMPORTANT
for Natural Rubber

IMPORTANT
for Synthetic Rubber

MICRONEX

Beads or Compressed

A COLUMBIAN COLLOID

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In Synthetic Rubber

WHEN Micronex is added to natural rubber the tensile, modulus and abrasion resistance are increased by amounts from thirty to over a hundred per cent.

These increments represent important improvements in specific properties of a material which itself exhibits great resilience and energy. Tensiles of 3000 pounds or more can be developed in natural pure gum rubber.

With Buna S, Micronex plays an all important role. Here the vulcanized basic material lacks tensile strength and elasticity. It is only when reinforced to a very considerable degree by a material of colloidal dimensions that it can act as a replacement for natural rubber. Tensile is advanced by 300 per cent.

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Interstate and Foreign Commerce subcommittee on May 27, Mr. Jones expressed the opinion that the setting of a price sufficiently high to stimulate nation-wide cooperation in the search for scrap might result in making 800,000 to 1,000,000 tons available for reclaiming. He placed total processing capacity of existing reclaiming plants at 300,000 tons a year, adding that 275,000 tons of reclaimed rubber were produced last year and that output has now been stepped up to 26,000 tons per month. Improved processing methods may result in that rate being stepped up to 35,000 tons per month, he said.

The decision to appeal to the people direct on the scrap rubber problem, as indicated by the President in his announcement, came as a result of the growing confusion on the amount of reclaimable scrap available. In the past thirty days there have been dozens of statements made as to amount of such scrap, but it must be emphasized that all such statements were the result of opinion not fact, since there is no exact method of determining the amount. The claim that there are 10,000,000 tons of scrap rubber available, one of the many made, must be dismissed on the grounds of logic, since, it is pointed out, this amount would mean more than 500 pounds for every family, or approximately 150 pounds per person, or the equivalent of 800,000,000 old tires, more than four-fifths of all the tires discarded by American motorists in the past twenty years.

The results of a special study, announced on June 6, led the U. S. Rubber Co. to estimate that approximately 500,000 long tons of scrap rubber might be recovered by extensive collection methods. The survey covers the last five years' supply. The company pointed out that whereas normally scrap not collected and reclaimed in the year it is discarded is considered lost beyond recovery, rubber scrapped in previous years will probably be brought to light in view of the current situation.

With approximately 730,000 tons of tires available, some 325,000 tons were consumed by reclaimers last year, the company reports, leaving a surplus of 405,000 tons. It is estimated that about 50% of this, or about 202,500 tons, is recoverable. A good harvest of the 1940 surplus should be gathered, the company feels, since this should be too far gone for re-use and yet not out of sight long enough to preclude its reappearance. This figure is also fixed at 50% of the surplus, or about 147,000 tons.

Beyond 1940 and 1941, the company states, the estimate is frankly speculative, but the recoverable invisible supply is believed to be about 25%, or 100,000 tons, for 1939, and 10% each for 1938 and 1937 totaling 35,000 and 30,000 tons, respectively. This reaches an approximate total of slightly over 500,000 long tons.

In announcing the results of the survey, U. S. Rubber stated that the number of tires scrapped each year is computed by a method which sets up the number of tires at the beginning of the year (on cars and in stocks). The production is added, net exports deducted, and the difference between this figure and tires in sight at the end of the year represents tires scrapped. The average tire scrapped in the past few years, it was said, weighed 28.7 pounds when new and lost 12% of its weight in use. Therefore, the average weight is 25 pounds per tire. To arrive at the net available supply the volume of scrap is increased 10% to allow for tube and other types of scrap, and net exports are deducted. About 85% usable rubber is yielded from scrap.

Improved Reclaiming Process

A method of reclaiming scrap which improves the quality of the reclaim, saves materials, and reduces the processing time so drastically that it increases the capacity of certain existing equipment by 60%, was also announced by U. S. Rubber last month. The processing cycle is said to be reduced from 16 to 9½ hours and at the same time the quality of the finished reclaim is improved because of a change and a reduction in the chemicals used.

In explaining the improvement, W. G. Kirby, manager of reclaim development for the Naugatuck Chemical Division, said that whereas in present processes the digester is charged with scrap, caustic soda, pine tar oils and water and the mass heated by steam under pressure and agitated for 16 or more hours, with the new method air is introduced into the chamber with the scrap, the steam pressure is increased to raise the temperature, the amount of pine tar oils is reduced, and the mixture is agitated for a much shorter time. The result, he said, is an improved quality of reclaim with a reduction of processing time and a saving in materials.

PROGRESS IS REPORTED ON GUAYULE, KOK-SAGYZ AND OTHER RUBBERS

According to a letter received from Major Evan W. Kelley, director of the Guayule Emergency Rubber Project of the Forest Service of the Department of Agriculture, the first steps in the project in the Salinas Valley, Calif., have been completed. Major Kelley reports that some 850 acres of plantations have been established; survival of the seedlings in the fields is meeting expectation; nursery beds, 400 x 4 feet, numbering 11,458, have been sown; and emergence of the seedlings in the beds is hitting a high percentage.

Prior to planting, the guayule seed was treated to step up germination, a process involving soaking in water to soften the hard shell, drying by centrifugal force, chemical treatment, and pre-sprouting. Within an hour from the start of germination, the seed had to go into the ground, mixed with damp sawdust. Special machines developed by the Intercontinental Rubber Co. did the planting and distributed sand over the seeds. The nursery planting took all available seed acquired from Intercontinental and will provide enough seedling plants for about 50,000 acres of field plantations next winter.

It is anticipated that taking up seedlings in nursery beds for planting in leased land will begin late in November. The Forest Service has been receiving hundreds of letters asking for guayule seeds and plants for private planting and points out that no seed or stock is available for general distribution and that very little is yet known of the possibilities of growing guayule in areas other than where the work is in progress. Land will be leased for next winter's field planting only after thorough investigation and soil tests.

The amount of rubber produced by cultivated guayule increases annually for a number of years. In the opinion of the Forest Service, the most economical harvesting rotation is usually four years, when a yield of from 1,200 to 1,500 pounds of rubber per acre can be obtained. The Service emphasizes the point that although plantings may be harvested earlier, substantial yields of guayule rubber cannot be expected in the immediate future.

Seed obtained from this year's plantings, however, will permit further expansion of planting next year, and should a prolonged rubber shortage make it desirable, the process of expansion could be continued as long as land suitable for growing guayule is available. At least 600,000 acres of guayule plantations would be required to provide 100,000 tons of rubber annually, according to the Forest Service, if one-fourth of the plantations were harvested every year. In the hope of developing more immediate sources of natural rubber, the Department of Agriculture is stepping up its investigations of several other rubber-producing plants. The U. S. Rubber Co. has also launched an investigation along these lines, full details of which will be found elsewhere in this issue.

The Department of Agriculture has also reported that a small shipment of *Kok-Sagyz* seeds for experimental planting has been received from Russia. The seed will be tested this summer at Agricultural Experiment Stations in about 20 northern states, Canada and Alaska, under climatic conditions like those of the areas in Russia where the plant is now being grown. *Kok-Sagyz* may be grown as an annual, but it is believed that yields of only 30 to 50 pounds of rubber per acre may be expected, although somewhat higher yields occasionally have been reported.

Some further support to the extraction of rubber from rabbit brush, which grows prolifically in the west, came from Sam B. Doten, director of the Hatch Experiment Station of the University of Nevada. Mr. Doten said that studies made by the experiment station show no reason why rabbit brush could not be raised as a rubber-producing crop in competition with rubber derived from guayule or from the rubber trees of the Far East and South America.

"The rubber of rabbit brush," he said, "is a genuine rubber of excellent quality. It is far better than the rubber found in the milkweeds of western America, better than the rubber from guayule." Its properties after vulcanization, he claimed, are inferior only to the best Brazilian rubber and to rubber from the Malayan plantations.

Mr. Doten stated that there are about twenty species of rabbit brush, some of which contain rubber and some of which have hardly any. This feature, he said, is one of the agriculturally promising features of the plant for it makes it seem possible that by the usual plant breeding methods a rich strain of the plant might be achieved.

The collection of wild rubber in various countries, particularly those in Latin America, to aid the dwindling stockpile of the United States, continues apace. The National Bank of Nicaragua, which will be the only purchaser of rubber in Nicaragua for export to the United States, in accordance with an economic agreement recently concluded, announced that it would pay at least 20 cents a pound for raw rubber and offered to send buyers to all rubber-producing sections of that country. An agricultural experiment station will soon be established, probably near Bluefields. The Atlantic coast region of Nicaragua is believed to be one of the best rubber-growing areas in Latin America.

Various countries in Africa are making plans to step up rubber collection to meet the current situation. In the Belgian Congo the administration has introduced a law requiring every native in the producing sectors to supply 60 pounds of rubber in 60 days each year. A factor that is expected to add at least 70% to the Belgian Congo's yield of only 1,400 to 1,500 tons before the war is the adoption of scientific tapping methods.

Free French Africa also is pushing plans for increasing rubber production and existing plantations in the Cameroons are said to be making a useful contribution. The Union of South Africa has called for tenders to tap *Euphorbia* trees. Dr. R. A. Dyer, government expert, a noted authority on Manihot and other South African rubbers, is said to have worked out a successful tapping process.

From Australia comes word that experiments are proceeding on the extraction of rubber from poinsettia. A 10% content is reported to have been found in certain species and consideration is being given to wide-scale extraction. Tests are also being made on skeleton weed, also known as gum succory, which has always been regarded as a noxious weed but which has a definite rubber content. Rubber from this plant is said to have been used in Russia.

Late in May, Brazilian Finance Minister Arthur de Souza Costa announced from Rio de Janeiro that the price of Brazilian rubber has been increased from 39 cents to 42 cents a pound. In accordance with the terms of an agreement recently signed in Washington, he said, the additional three cents will be used to defray the cost of rubber exploitation. According to this agreement, the Rubber Reserve Co. will pay a premium of 2½ cents a pound for all rubber received from Brazil in excess of 5,000 tons up to 10,000 tons and of 5 cents a pound over 10,000 tons. These premiums, together with a credit of $5,000,000 granted to Brazil, will also be used to develop rubber production.

SEVERAL NEW AMENDMENTS TO TIRE RATIONING REGULATIONS ARE ISSUED

There has been considerable official action on tires and tubes in the past month. On May 12 Jesse Jones announced that the R.F.C., through the Defense Supplies Corp., a subsidiary, would make available $150,000,000 for the purchase of both new and used tires or tubes held by consumers. This was in addition to the plan announced earlier by which the D.S.C. is financing to the extent of $75,000,000 the frozen stocks of new passenger tires and tubes held by manufacturers, mass distributors, jobbers and dealers.

The new tire program will provide for acceptance of voluntary contributions from consumers as well as payment in either war bonds or cash in those instances in which the tires are sold to the government. The program will be administered locally through the county tire ration boards of O.P.A. and R.F.C. loan agencies throughout the country. Price Administrator Henderson, however, has made it clear that the local boards will not be asked to take in or resell tires under the plan. Details of the purchase plan have not yet been worked out.

Four New Amendments Issued

Four additional amendments to the Revised Tire Rationing Regulations have been announced by O.P.A. since our last issue, as follows:

Amendment No. 9, which became effective May 15, permits retreaders to replenish camelback stocks on the basis of the amounts actually necessary for retreading or recapping a tire larger than those previously provided for by the replenishment table in the regulations. Where possible, the amount of camelback for replenishment still must be calculated on the basis of the existing table, but when more than 55 pounds is necessary for tires 12.00-24 and larger, a retreader who wishes to replenish his stock for the amount used must attach to Part B of Form R-8 (the replenishment part of the certificate issued by the local board) a statement of the amount actually used in performing the service.

Amendment No. 10, effective May 23, permits bus transportation companies to enter into new tire and tube leasing contracts with tire manufacturers or wholesalers. Necessary changes to open the way to new contracts, hitherto forbidden, are contained in the amendment. Approximately 80% of all buses operate under lease plans.

Amendment No. 11, effective June 1, provides regional reserve quotas of tires and tubes upon which regional administrators of O.P.A. may draw for adjustment of emergency needs. The regional reserve plan was adopted to facilitate allotment of additional quotas to states when heavy demand exhausts both the regular quota and the state reserve. Heretofore, extra allotments could be made only from the national reserve. Regional reserves will neither decrease nor increase the total amount of all reserves.

Amendment No. 12, effective June 8, adds two more classifications to the List A eligibles, *i.e.*, vehicles operated exclusively for the transportation of passengers as part of the services rendered to the public by a regular transportation system and those used for the transportation of children under 18 years of age and their attendants to and from summer camps.

June Tire Quotas Reduced

The June tire quotas, announced by Mr. Henderson on May 22, contrary to the seasonal pattern of replacement sales, were reduced from those of May. The June quota makes available 49,584 new tires for List A passenger vehicles, 479,051 recapped tires or recapping services for List A and B, and 265,007 tubes. These figures compare with 55,573 new tires, 578,092 recaps, and 315,058 tubes allowed in May.

The truck tire quota, which provides for buses, trucks, industrial tractors, and farm equipment, includes 247,715 new tires, 365,014 recaps, and 309,116 tubes, compared with 238,259 new tires, 379,060 recaps, and 328,836 tubes in May. The reduction, 16.5% below May, was made as a further step in the conservation of rubber.

Price Decisions on Tires

A formal price order—Maximum Price Regulation No. 143—establishing maximum prices for all wholesale sales of new replacement tires and tubes at the levels which heretofore have applied to manufacturers and mass distributors

under voluntary agreement with O.P.A., was announced by Price Administrator Henderson on May 15. The order, which covers tires and tubes for passenger cars, trucks, and other vehicles, does not depart from existing informal price ceilings, but it brings within its scope wholesalers not heretofore specifically covered. The order was effective May 18.

Maximum retail prices for passenger car tires and tubes which fall within a special classification of discontinued brands, sizes and types have been set at a level corresponding to the ceiling prices that were in effect during March of this year for current brands in Amendment No. 2 to Revised Price Schedule No. 63, effective May 18. This classification, known as Exhibit C, includes tires and tubes which were manufactured after December 31, 1937, but which did not appear as active brands on manufacturers' or distributors' price lists as of November 1, 1941. The amendment also sets forth a formula for determining the ceilings on new tires and tubes for special purpose trucks and buses, off-the-road equipment, industrial and commercial tractors, trailers, industrial equipment, farm implements, and motorcycles.

Used tires or tubes that are not serviceable without repairs may not be sold at the ceiling price which would apply to them if they were undamaged or already repaired. This was made clear in Amendment No. 2 to Maximum Price Regulation No. 107, effective May 26, issued by O.P.A. The amendment provides that the maximum price for any unrepaired used passenger car or truck tire or tube is the level established in Regulation No. 107, less an amount equal to the charges prevailing in the locality of the seller on March 7, 1942, for the repairs necessary.

Additional Tire Regulations

Additional regulations affecting the tire and tube industry since our last issue included the following:

An extension of time within which long-haul truck and bus operators may apply for emergency reserves of tires and tubes under a plan put into effect on April 22 by O.P.A. was announced on May 19. Applications to local rationing boards for the special certificates needed to set up the reserves were to have been accepted through June 15. Originally, May 15 had been set as the deadline.

Exemption No. 3 to Limitation Order L-36, issued on May 12 by W.P.B., removes tires, tubes and automotive replacement parts from the supplies covered by the order. Because these particular supplies are adequately covered by other W.P.B. and O.P.A. orders, it was deemed unecessary to keep them under the general inventory control imposed by the limitation order.

On May 20 the Office of Defense Transportation issued an order—General Order O.D.T. No. 10—banning all sightseeing bus services and limiting chartered bus services to such essential operations as transportation of members of the armed forces, war workers, and school children. It was estimated that the order, which became effective on June 1, will result in a saving of more than 100,000 pounds of crude rubber a year.

CHICAGO GROUP HEARS SIBLEY AND ELECTS 1942-43 OFFICERS

R. L. Sibley, director of research and development for the Rubber Service Department of the Monsanto Chemical Co., was the principal speaker at a meeting of the Chicago Group, Rubber Division, A.C.S., held at the Congress Hotel on May 1. Mr. Sibley delivered his lecture on "Some Reaction Products of Rubber," pointing out that descriptive data on most of these products were to be found in patents rather than in the technical literature. The talk was largely in the nature of a review.

At the annual election, the following officers were chosen for the 1942-43 season: *Chairman,* Calvin Yoran (Featheredge Rubber); *Vice-Chairman,* E. Meyer (Herron & Meyer); *Secretary-Treasurer,* Bruce Hubbard (Ideal Roller). The following were elected to the Executive Committee: H. Boxser (Western Felt), E. Horan (Inland Rubber), R. G. Penner (Salisbury Co.), U. H. Harmon (Dryden Rubber), C. Baldwin (United Carbon), W. N. Crumpler (Mepham Co.), G. Maassen (Vanderbilt), B. W. Lewis (Wishnick-Tumpeer), and H. A. Winkelmann (Dryden Rubber).

Continental Active in Latin America

The current need for increased crude rubber production in Latin America for shipment to the United States has resulted in a growing demand for washing and drying machinery. Harry J. Smith, of the Continental Machinery Co., New York City, reports that his company has been active recently in installing such equipment in both South and Central America and is also furnishing the engineers to get these plants into operation. Continental Machinery Co. has, over a period of years, designed and installed complete equipment for the manufacture of many types of rubber and latex products in almost all foreign countries and is now engaged in building complete rubber and reclaiming plants in South America to meet local needs for finished rubber products formerly imported from the United States and other countries.

Rebuilt Tubes Are Taxable

The Office of the Commissioner of Internal Revenue, in a letter to the Rubber Manufacturers Association, dated May 14, 1942, has ruled that the rebuilding of inner tubes involves a manufacturing operation and accordingly the sale of rebuilt tubes is subject to the excise tax imposed on rubber goods. The process of rebuilding tubes consists of making tubes for automobile and truck tires out of old or damaged tubes by replacing a section of a tube with a section cut from another tube, the two sections being cemented and vulcanized to form a usable tube.

Dissolving Gulton Metal Firm

In accordance with a decision reached by the board of directors last April, the Gulton Metal Refining & Chemical Corp., Metuchen, N. J., is being dissolved. Allan A. Lubitz, president of the American Firstoline Corp., New York City, reports that he has already resigned as a director of the refining company and that he, as well as the American Firstoline Corp., has severed all connections with the concern. The American Firstoline Corp. will continue the manufacture, conversion, distribution and export of various chemicals and pigments, including zinc oxides, zinc dust, zinc stearate, etc., for its own account.

Goodrich Launches Rubber Study

Increased study of new sources for rubber has been undertaken by the B. F. Goodrich Co., Akron, according to Dr. H. E. Fritz, director of research. Dr. Harlan L. Trumbull, who has been manager of the chemical research department since 1922, has been selected to head the new research project. Dr. Trumbull has been connected with the company for the past 23 years in research capacities.

Chicago Outing on June 27

The Chicago Group, Rubber Division, A.C.S., will hold its annual outing at the Lincolnshire Country Club, in Crete, Ill., on Saturday, June 27. Although a golf tournament will be the feature attraction, there will also be swimming, tennis, riding and other sports. Dancing is scheduled for after dinner and members and guests are invited to bring their ladies. The charge for golf and dinner will be $2.75; dinner alone, $1.50. James P. Sheridan, sales representative of the New Jersey Zinc Co., is chairman of the outing.

New Goodrich Film on Rubber

The dramatic story of rubber in transportation and its vital role in the fight to be carried to the enemy is the theme of a new sound film recently completed for national release by the B. F. Goodrich Co., Akron. Titled, "Keep 'Em Rolling," the film stresses the urgent need for rigid conservation of tires, points out the important role played by tires in construction, mining, logging and other fields, and depicts the use of tires on combat vehicles, including scout cars, artillery tractors and supply trucks.

LOS ANGELES GROUP HOLDS LAST MEETING OF SEASON

The last supper meeting of the current season was held by the Los Angeles Group, Rubber Division, A.C.S., at the Mayflower Hotel in Los Angeles on June 2. Approximately 115 members and guests were in attendance.

The big feature of the evening was a demonstration of the work and method of Training Within Industry by John B. Calhoun, schedule supervisor. Mr. Calhoun gathered a group of executives around a table, each representing a foreman in a factory, and showed the practical method used by T.W.I. He proved by demonstration the value of the four steps in starting out a new employee in a factory. The four steps as he brought them out are: (1) Prepare the worker to receive the instruction; (2) Present the operation; (3) Try out his performance; (4) Follow-up. The demonstration showed how not to do it as well as how to do it. Participating also were William Hopkins, district head in T.W.I., and Charles Fishburn, assistant.

War pictures, depicting the methods of Russian mechanized forces in winter maneuvers and the recent American assault on the Marshall Islands, were shown by O. A. Coons. Several new members were voted in including Edward C. Courtois (U. S. Rubber), Charles L. Fetzner (Monsanto), Frederick Anderson (Imperial Paper), and A. R. Baldwin (Schrader).

E. G. Brooks, of the Golf Ball Service Co., chairman of the Golf Committee, announced that a tournament was to be held on June 6 and about 20 members indicated their intention of playing. Ed Royal, of H. M. Royal, Inc., announced that the annual summer fishing trip has been called off due to wartime conditions and that a two-day outing would be held in its stead.

The outing will be held at the Uplifters' Club on July 24 and 25. There will be accommodations for approximately 60 members at an over-all cost of $7.50 each. The men will meet for an evening supper, play games during the evening, have a midnight barbecue, breakfast the next morning and a full day program of outdoor sports. A buffet lunch at 4 P.M. Saturday and awarding of prizes will conclude the two-day event. A strict requirement, Mr. Royal reported, would be old clothes and a severe fine for anyone attending "dressed up."

Prizes were awarded as follows: A $25 war bond donated by the Braun Corporation, through Al Pickard, was won by Charles L. Fetzner, of the Monsanto Chemical Company, a new member. War stamps donated by the group from the treasury were won by Robert F. Pfister (Goodyear), $10; W. J. VonderReith (Sierra), $5.00; and J. J. Wildman (Commercial Rubber), $3.75. A pen and pencil set donated by the Olds Alloy Company through R. B. Olds, was won by Herman Libkind of Western Insulated Wire, Inc. An electric shaver donated by Claus VonderReith (Sierra) was won by Charles Lamb, Sr., (West America). Table favors were booklets each containing a 25-cent war stamp. These were donated by the Braun Corporation through Al Pickard.

This was the last dinner meeting until October 6. The meetings this year have been unusually well attended and the type of program especially instructive. The membership was increased noticeably. The president, Gaelen K. Norton, holds over until the end of the calendar year.

Coming Events

June 19. Akron Rubber Group, Outing, Fairlawn Country Club, Akron.

June 22-26. A.S.T.M., 45th Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, N. J.

June 26. Rhode Island Rubber Club, Outing, Metacomet Golf Club, East Providence, R. I.

June 27. Chicago Rubber Group, Outing, Lincolnshire Country Club, Crete, Ill.

July 24-25. Los Angeles Rubber Group, Uplifters' Club, Los Angeles, Calif.

Sept. 10-11. Rubber Division, A.C.S., Fall Meeting, Hotel Lafayette, Buffalo, N. Y.

Oct. 12-14. American Society of Mechanical Engineers, Fall Meeting, Rochester, N. Y.

Nov. 17-22. Second National Chemical Exposition, Stevens Hotel, Chicago, Ill.

Slate of Nominees Presented

The following slate of nominees for the various offices of the Rubber Division, A.C.S., for the coming year has been submitted by the Nominating Committee: *Chairman,* J. T. Blake (Simplex Wire); *Vice-Chairman,* Harold Gray (Goodrich) and W. W. Vogt (Goodyear); *Secretary,* H. I. Cramer (Sharples Chemicals); *Treasurer,* C. W. Christensen (Monsanto); *Sergeant-at-Arms,* M. J. DeFrance (Goodyear) and E. H. Nahm (Naugatuck Chemical); *Directors,* A. W. Carpenter (Goodrich), A. M. Neal (DuPont), S. M. Cadwell (U. S. Rubber), L. V. Cooper (Firestone), J. M. Ball (Vanderbilt), F. W. Frerichs (Cupples). Mr. Carpenter is currently with the Bureau of Industrial Conservation and Mr. Ball with the Division of Civilian Supply, both W.P.B. activities. A letter ballot on these nominees will be held about August 1. The Nominating Committee consisted of G. K. Hinshaw (Goodyear), chairman, and R. H. Gerke (U. S. Rubber), H. L. Trumbull (Goodrich), E. B. Curtis (Vanderbilt), and Ira Williams (Huber).

MISCALL AND CRAMER HEARD BY NEW YORK RUBBER GROUP

Dr. J. Miscall, of the Flintkote Co., Morristown, N. J., and Dr. H. I. Cramer, of Sharples Chemicals, Inc., Philadelphia, Penna., who is also secretary of the Rubber Division, A.C.S., were the principal speakers at the technical meeting of the New York Group, Rubber Division, A.C.S., held at the Building Trades Club in New York City on May 15. The meeting, attended by approximately 200 members and guests, supplanted the usual summer outing.

In discussing "The Place of Rubber Dispersions in the War Effort," Dr. Miscall first made it clear that the manufacture and sale of crude, reclaim and synthetic rubber dispersions were under strict control and their use must be justified in the light of the war effort. He briefly discussed the manufacturing steps involved in the production of dispersions and then pointed out their advantages and disadvantages, the major characteristic of the latter being limitation of tensile strength. Among the advantages is the fact that dispersions are "tailor-made" and can be controlled from start to finish. In conclusion, the speaker listed various uses to which dispersions had been put.

The second speaker, Dr. Cramer, gave his lecture on "Synthetic Rubber" which he has been giving before various technical organizations during the past several months, including local sections of the A.C.S. The lecture was largely in the nature of a review, and traced the development of synthetic rubber, from the methyl rubber used by Germany in the last war to present-day types of polymers and copolymers. Through the use of numerous slides, Dr. Cramer discussed the chemical structure, physical properties, processing characteristics, present and planned production, and the economical aspects of the various synthetic rubbers, including neoprene, Thiokol, Buna N and S, and Butyl Rubber. The talk was very comprehensive and well received.

During dinner entertainment was furnished by an attractive accordionist while after dinner a complete floor show featuring novelty and fun was presented through the services of Carlton M. Hub, theatrical agency of New York. Five attractive gifts, purchased by the group from its own treasury, were distributed as door prizes. The next meeting of the group will be held sometime in the fall.

Set Date for R. I. Outing

The annual outing and golf tournament of the Rhode Island Rubber Club will be held at the Metacomet Golf Club, East Providence, R. I., on Friday, June 26. A program for presentation after dinner is being arranged, although details are lacking at this writing. L. K. Morrow, of the Anaconda Wire & Cable Co., Pawtucket, is secretary-treasurer of the club.

RUBBER DIVISION TO MEET ON SEPTEMBER 10 AND 11

The 104th Meeting of the American Chemical Society is to be held in Buffalo, N. Y., the week of September 7. The meeting of the Rubber Division has been scheduled for Thursday and Friday, September 10 and 11. Headquarters for the Division will be at the Hotel Lafayette and since the prospects for a large attendance are good those planning to attend are urged to make early reservations.

In consequence of the Division's having foregone meeting at the Memphis Convention of the parent society last April, extraordinary efforts are being made to insure an excellent and timely program at Buffalo. Plans are now under way to arrange a series of special papers directed at the vital problems growing out of the metamorphosis which the rubber industry is currently undergoing. While a specific announcement cannot be made at this writing, it can be stated that tentative approval has been secured from Washington for the presentation of papers dealing with various phases of the synthetic rubber program.

In addition to the program of special papers, as many sessions as may be required will be devoted to papers of a general nature. The Division suggests that now is the time to submit papers contemplated for some time. The deadline for sending abstracts of intended papers is July 10. The abstracts should be submitted, in triplicate, to the secretary of the Division, H. I. Cramer, c/o Sharples Chemicals, Inc., 23rd and Westmoreland Streets, Philadelphia, Penna. Abstracts should be 200 to 250 words in length.

All local arrangements for the coming meeting, including the banquet which will be held on Thursday, September 10, at the Statler Hotel, will be in the hands of the Buffalo Rubber Group, of which John Plumb and Howard Wiley, both of the U. S. Rubber Reclaiming Co., are chairman and secretary-treasurer, respectively. Burt Wetherbee, of the Globe Woven Belting Co., is also cooperating in making the arrangements. Light entertainment will be presented at the banquet.

Introduce Extendex C

Extendex C, a sponge-like material prepared from vegetable oils, which can be used to replace from 5 to 20% of the rubber hydrocarbon in all types of compounds without sacrificing any of the physical properties, has been introduced by Wishnick-Tumpeer, Inc., 295 Madison Ave., New York City. The new material is said to be radically different from vulcanized oils in its effects on the properties of rubber. It enters into the vulcanization reaction and requires the same amounts of sulfur, accelerator and zinc oxide as does the rubber hydrocarbon. It is insoluble in water and in common organic solvents and can be used in compounds requiring chemical resistance. In addition to serving as an extender, Extendex C also acts as a plasticizer and as a dispersing agent for carbon black in heavily loaded compounds. According to the manufacturer, the new material may be used in place of rubber on tires without loss of resistance to abrasion or wear.

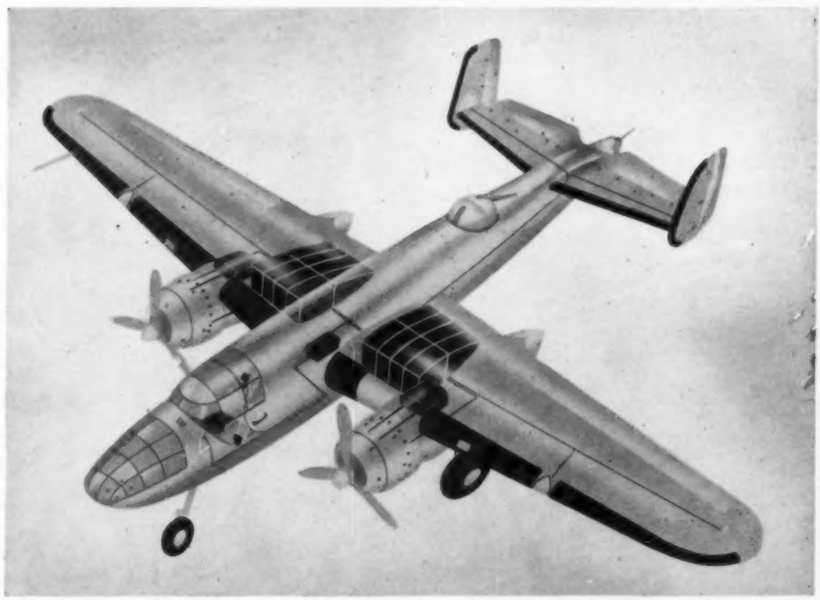
Grant Review in Carbon Suit

The Supreme Court of the United States on May 14 granted a review sought by the United Carbon Co. of the recent decision of the Circuit Court of Appeals for the Fourth Circuit holding that the company had infringed the Wiegand-Venuto patent (No. 1,889,429) which covers a method for the manufacture of the pellet form of carbon black, owned by the Binney & Smith Co. The original suit alleging infringement was brought by Binney & Smith and was dismissed by the Federal Court of Charleston, West Virginia, in February, 1941, on the grounds that there were recognizable differences between the pellet blacks sold by plaintiff and defendant and that the patent involved was lacking in novelty. This decision was reversed by the Appellate Court in January, 1942, the court holding that the patent was valid and infringed. It is this latter decision that has been appealed by United Carbon. The appeal will be heard later in the year.

Detroit Group Hears Somerville

Dr. A. A. Somerville of the R. T. Vanderbilt Co., New York City, was the principal speaker at a meeting of the Detroit Rubber & Plastics Group, Inc., held at the Detroit-Leland Hotel in Detroit on May 8. Approximately 200 members and guests attended the meeting. Taking as his subject "Developments on Synthetic Rubber as Related to Accelerators and Plasticizing and High Temperature Testing," Dr. Somerville devoted most of his talk to the results of tests conducted in the Vanderbilt laboratory on Buna S compounds, particularly tire tread compounds. He compared the physical data with that of standard rubber tread compounds. Liberal use was made of charts during the course of the talk. During the business session, John Dudley (Chrysler Corp.), chairman of the group's educational committee, presented a report on progress being made in setting up complete laboratory and engineering equipment at Wayne University in connection with the courses on rubber and plastics to be given at the University under sponsorship of the Detroit Group. He revealed that sufficient equipment was installed to start a 12-week course in plastics as an introductory course preparatory to fully credited courses that will start with the coming fall term. The proposed fields of study cover rubber, synthetic rubber, plastics and adhesives.

USE OF RUBBER AND SYNTHETIC RUBBER IN AMERICAN MEDIUM BOMBERS



The shaded portions in the above drawing of an American medium bomber indicate the use of rubber and synthetic rubber in the construction of the aircraft and its accessories. In addition to the parts indicated, including self-sealing fuel tanks and deicers, more than eight miles of rubber-covered wire and cable is used in a bomber of this size and type. The B. F. Goodrich Co., which furnished the drawing, now produces more than 80 items for aeronautical uses.

FINANCIAL NEWS

Norwalk Tire & Rubber Co.

Six Months Ended March 31: Net profit of $64,293 after provision of $85,902 for Federal income and excess profits taxes and $60,000 for contingencies, equal to $7.32 each on 8,784 shares of 7% cumulative $50-par preferred stock. Dividend arrears on this stock amount to $3.93 a share. Allowing for six months' dividend requirements on preferred stock, the balance was equal to 24c each on 202,230 common shares. A net loss of $16,769 was reported for the corresponding period of the previous year. Net sales for the periods were $1,956,248 and $1,321,289, respectively.

Rome Cable Corporation

Year Ended March 31: Net profit of $431,165 after provision of $170,000 as a reserve against future price declines in copper and for other contingencies, equal to $2.27 each on 189,830 shares, which compares with $385,460, or $2.03 a share, after $40,000 reserve against a price decline in copper, reported for the previous fiscal year. Current assets as of March 31, 1942, amounted to $2,847,912, and current liabilities to $533,468.

United Carbon Company

First Quarter: Net profit of $522,111, after provision of $345,000 for Federal income and excess profits taxes, equal to $1.31 each on 397,885 shares of common stock. This compares with $540,028, or $1.36 a share, reported for the corresponding quarter of 1941.

Lee Rubber & Tire Corp.

Six Months Ended April 30: Net profit of $598,364, equal to $2.48 each on 241,509 capital shares, which compares with $450,704, or $1.68 each on 268,343 shares, reported for the corresponding period of the previous year. Net sales totaled $7,967,972 and $7,210,998, respectively.

Belden Manufacturing Co.

First Quarter: Net profit of $153,339, after provision of $26,318 for contingencies and $268,000 for taxes, equal to 63c a share on 241,547 capital shares, which compares with $130,014, or 54c a share, last year. Net sales amounted to $2,273,402 and $2,179,772, respectively.

Jenkins Brothers

For 1941: Net income of $492,593 equal after preferred dividends to $3.56 each on 126,372 common shares, which compares with $345,783, or $2.40 a share, in 1940. Net sales amounted to $8,813,253 and $4,272,281, respectively.

Columbian Carbon Co.

First Quarter: Net income of $841,814 after provision of $600,000 for Federal taxes, equal to $1.57 each on 537,406 shares outstanding, which compares with $1,089,335, or $2.03 a share, in the corresponding quarter of last year when tax charges amounted to $300,000.

O'Sullivan Rubber Co.

For 1941: Net income of $174,807 which contrasts with a net loss of $103,325 reported for the year of 1940. Despite restrictions on the use of rubber the company is believed to be holding up well this year.

Brown Rubber Co.

Fifty-two weeks to January 3: Net profit of $20,780, equal to 10c each on 200,000 shares, which compares with $33,013, or 16c a share, reported for the fifty-three weeks ended January 4, 1941.

Zipacel—A New Accelerator

Zipacel, a new rubber accelerator said to be notable for its speed of cure at relatively low temperatures, has been introduced by the Barrett Division of the Allied Chemical & Dye Corp., 40 Rector St., New York City. Zipacel is piperidinium pentamethylenedithiocarbamate. It has a specific gravity of 1.13, is white to light cream in color, powder in form, and has a melting point about 165° C. at time of shipment. As a primary accelerator in latex compounds it has been found to function well in proportions of 0.25 to 1.0 part per 100 parts of rubber hydrocarbon. One to two parts of sulfur and one to five parts of zinc oxide are used, depending on the type of compound. It does not as a rule contribute to the thickening or coagulation difficulties of well-balanced latex formulas. Ordinarily, precuring of the latex mix is not a serious factor in compounds containing the new accelerator. When blended with thiazole-type accelerators in milled stocks, the combination provides a reasonable degree of safety in processing yet cures rapidly, giving good aging and high modulus stocks.

General Tire & Rubber Co., Akron, has made available a booklet on "Guayule" which gives much valuable information about that plant, tracing its development over the past 30 years. A simplified picture of the present rubber situation is also given by the booklet. Copies are available on request to the company.

Washington Appointments

Alden C. Brett, treasurer of the Hood Rubber Co., who has been associated with W.P.B. since last fall, has been appointed Deputy Coordinator for Rubber. He will act as Mr. Newhall's representative in negotiations with South American countries and other government agencies for expanding the supply of rubber.

John W. Bicknell, managing director of the plantation division of the U. S. Rubber Co., has been elected a vice-president of the Rubber Reserve Co. and will make his headquarters in Washington. Mr. Bicknell, who has been "loaned" to Rubber Reserve, will direct the government's wild rubber procurement program.

W. S. Lockwood, formerly American representative of the British Rubber Publicity Association and more recently connected with the Rubber Manufacturers Association, has been named administrative assistant of the Rubber Reserve Co.

L. H. Chenoweth, manager, manufacturers' sales, industrial products sales division, B. F. Goodrich Co., has been granted a leave of absence to serve with the Technical Section, Rubber Branch, W.P.B.

Bradley Dewey, president of the Dewey and Almy Chemical Co., and E. B. Babcock, chief chemist of the Firestone Tire & Rubber Co., have been named as civilian field consultants on rubber of the new Advisory Board to the Resources Division of the Office of the Army Quartermaster General. They will advise on problems relating to clothing, transport and special equipment for the Army and the best use of vital materials.

Dr. Charles F. Phillips has been named chief of the tire rationing branch of the O.P.A., succeeding Grenville R. Holden, who has been acting as special assistant to Leon Henderson during the formation of the tire rationing division. Robert S. Betten has been named associate chief.

John C. Stedman has been named head of the legal department of the tire rationing branch of O.P.A. and John Nicholson Cole to the corresponding position in the rubber price branch. Daniel Margolies, who had been serving in both capacities, has been transferred to the Board of Economic Warfare.

Baxter Wood, connected with the Goodyear Tire & Rubber Co., Akron, in sales and service work since 1927, has been named a tire specialist in the Office of the Quartermaster General. He will serve in a civilian capacity.

B. M. Fairbanks, research chemist at the plant of Jenkins Bros. in Bridgeport, Conn., has left the employ of that company.

BOSTON RUBBER GROUP HAS ALL-DAY SUMMER MEETING

With the afternoon devoted to sports and frolic and the evening given over to the usual technical session, the Boston Group, Rubber Division, A.C.S., held a summer meeting at the University Club in Boston on June 12. The meeting replaced the usual summer outing, called off because of wartime conditions. Approximately 180 members and guests attended the meeting, most of whom participated in the afternoon program.

The business session featured two speakers, the first of which was Dr. A. B. Hoel of the Processing Oil Division of the Sun Oil Co., Philadelphia, who took as his subject "Some Aspects of Petroleum Refining in the Year 1942." Dr. Hoel described refining of petroleum in general, traced the development of the process from the old batch method to the present distillation methods, outlined the cracking process, and described the manufacture of 100-octane aviation fuel which, he said, is now being made in about 20 plants. He also discussed the manufacture of chemicals from petroleum which is rapidly becoming an important aspect of the industry.

The second speaker was Carveth Wells, noted adventurer and explorer, and currently official lecturer of the War Department. Mr. Wells discussed the "Battle for Tin and Rubber," giving a humorous talk and including the presentation of motion pictures taken by himself in Malaya. Both the talk and film were well received.

Several contests were held during the afternoon program. The winners of the badminton tournament were Harry Atwater and H. J. Clark, both of Hood Rubber. In the swimming events Jim Christopher (Titanium Pigment) won the 25-yard free style swim, Bob Cowan (Quabaug Rubber) won longest plunge honors, while a team composed of Jim Christopher, Ken Bolton (Titanium Pigment), Bob Cowan and George Jatinen (Schulman) won the relay race. In the bowling contest, honors for high single went to Ken Winkley (Hodgman Rubber) and the high three-string run was won by Leo Collett (Davidson Rubber). Prizes, largely in the form of defense stamps and bonds, were awarded to the winners of the various contests. Companies contributing to the purchase of prizes included the following:

L. Albert, American Cyanamid, American Resinous Chemicals, American Zinc Sales, T. C. Ashley, Baker Chemical, Carter Bell, Binney & Smith, Stewart Bolling, Boston Woven Hose, Brockton Machine, Cabot, Campbell Machine, Cleveland Liner, Continental Carbon, Converse Rubber, James B. Cunningham, Dicalite, DuPont, Wm. D. Egleston, Eustis-Pennock, H. T. Feinberg, C. E. Gale, General Atlas, General Electric, Hird & Connor, Hodgman Rubber, Hood Rubber, J. M. Huber, Ralph Huber, Hycar Chemical, Imperial Paper, Innis-Speiden, Ernest Jacoby & Co.

Krebs Pigment, D. H. Litter, Mallinckrodt Chemical, Malrex Chemical, Monsanto Chemical, H. Muehlstein, Naugatuck Chemical, N. J. Zinc, Niagara Sprayer, A. C. Nispel, Panther-Panco Rubber, Phillip Bros., Plymouth Rubber, RUBBER AGE, Sanford Mills, Schrader, Schulman, Henry L. Scott, Simplex Wire, Stamford Rubber Supply, Stanco Distributors, Thiokol, Wm. R. Thropp, Titanium Pigment, Turner Halsey, Tyer Rubber, United Carbon, Vanderbilt, Vansul, Weller Chemical, L. G. Whittemore, Chas. T. Wilson, Wishnick-Tumpeer, and Xylos Rubber Co.

Sebrell Named Goodyear Lecturer

Dr. L. B. Sebrell, manager of the research department of the Goodyear Tire & Rubber Co., Akron, has been named Charles Goodyear Lecturer for 1942 by the committee of the Rubber Division, A.C.S., in charge of this award. His lecture, under the title of "The Second Mile," indicative of the fact that preliminary research and development on synthetic rubber has been consummated and there now remains considerable research in improving these synthetics, will be given during the Buffalo meeting of the Division, to be held on September 10 and 11.

Dr. Sebrell was born on November 19, 1894, at Alliance, Ohio. He received his B.Sc. from Mt. Union College in 1916 and his M.Sc. from Ohio State University in the same year, receiving his Ph.D. from the latter university in 1922. In 1917-18 he served with the Chemical Warfare Service and in 1918-19 was a chemical instructor at the Case School of Applied Science.

From 1919 to 1921 Dr. Sebrell worked with Goodyear as a research chemist, leaving in the latter year to act as an instructor at the University of Wisconsin and do graduate work. In 1922 he did graduate work at Ohio State at the conclusion of which he rejoined Goodyear, becoming manager of the research department in 1928.

Dr. Sebrell holds several patents on rubber accelerators and anti-oxidants and is the author and co-author of numerous articles on rubber technology. In addition to his A.C.S. membership, he is a member of several other technical and fraternal organizations, including Sigma Xi, Gamma Alpha and Phi Lambda Upsilon.

GEORGE S. HASLAM, of the Palmerton, Penna., laboratories of the New Jersey Zinc Co., has been appointed by the Executive Committee of the Rubber Division, A.C.S., as a director of that Division to fill out the balance of the term of the late C. R. PARK.

C. P. MOREY has been named purchasing agent for the Armstrong Rubber Co., West Haven, Conn., succeeding PERRY H. BASCOM, resigned.

FINAL MEETING OF SEASON HELD BY THE QUEBEC GROUP

The Quebec Rubber & Plastics Group held its final meeting of the current season at the Ritz Carlton Hotel in Montreal, Canada, on May 8. The scheduled lecture by A. E. Byrne, plastics sales engineer of the Canadian General Electric Co., on "Plastics" had to be cancelled due to the inability of the speaker to appear, but the company arranged to have R. N. Fournier, industrial heating engineer, give an illustrated lecture on "Special Applications of Electricity for Heating in Industry."

Mr. Fournier described at length the practical application of infra red rays for drying paints and varnishes and for vulcanizing thin rubber sheets. A keen interest in the subject of his lecture was evidenced by the large number of questions put to him during the discussion period following his talk.

At the business session, the secretary-treasurer gave a report of the group's financial status and announced that next year the group will become the Rubber & Plastics Division of the Society of Chemical Industry. The Montreal branch of the Society extended the invitation to the group to become affiliated with it and the parent English Society has approved the necessary changes in the constitution. It was also revealed that a summer outing was under consideration, with a final decision to be rendered shortly.

The election of officers, held during the meeting, resulted in the following: *Chairman*, Peter Gunter (Mack Moulding); *Vice-Chairman*, A. B. Lewis (British Rubber); *Secretary-Treasurer*, R. V. V. Nicholls (McGill University). The following were elected members of the Executive Committee: J. T. Dunn (Dominion Rubber), J. H. McCready (Hale Bros.), N. C. Smith (Dominion Rubber), H. L. Blachford (Blachford Co.), L. C. McLeod (Monsanto Chemical), and W. P. B. Gedye (Miner Rubber).

Master Offers Plan to Stockholders

Master Tire & Rubber Corp., Findlay, Ohio, has presented a plan for eliminating the preferred stock and clearing up dividend arrears to stockholders. The plan calls for issuance of a new debenture issue. Under it, each $4.00 preferred share and rights to unpaid dividends would be exchanged for one $40.00 debenture bearing 4% interest, three shares of new common stock, with a stated value of $2.25 a share, and $2.80 in cash. Master Tire now has 19,534 shares of preferred stock outstanding. Present common shares, which have a stated value of 10 cents a share, would be exchanged for an equal number of new common shares. The debentures would mature on January 1, 1967.

LOS ANGELES NEWS

G. G. Balasz, formerly chief compounder for Goodyear in Los Angeles, and one-time president of the Los Angeles Rubber Group, who has been stationed at the Goodyear plant in Wolverhampton, England, for the past several years, has returned to the United States. At this writing he has not yet been assigned to new duties, but it is thought that he may return to Los Angeles.

Gaelen Norton, of the Kirkhill Rubber Co., president of the Los Angeles Rubber Group, celebrated his 16th wedding anniversary on June 2. The occasion, however, did not prevent his presiding over a meeting of the group held that same night.

Lee Young, foreman of the self-sealing fuel tank division of Goodyear at Akron, was in Los Angeles for several days recently inspecting the local set-up. Ben Kirk, foreman of the similar division in Los Angeles, recently spent three weeks in Akron.

T. Kirk Hill, president of the Kirkhill Rubber Co., returned to Los Angeles early this month after an extensive business trip which took him to Chicago, Detroit and other cities.

G. L. Hillebart, representative covering the southern California area for the L. H. Butcher Co., and an active member of the Los Angeles Rubber Group, has been accepted in the Volunteer Officers Training Corps. He is scheduled to go into training on June 27.

Howard Middleton, co-partner of the Goodyear Rubber Co. of San Francisco, who recently left the hospital after an extended stay, has returned to the hospital for further treatment at this writing.

Frank T. Austin, office manager for the Santa Fe Rubber Mills, Los Angeles, died on Monday, May 25, at the age of 47, after an extended illness. He leaves a widow and a son.

R. B. Stringfield, who has been acting as coordinator of defense training at the University of Southern California for some time, has been appointed head of the materials and processes department of Vultee Aircraft, Inc., at Downey, a suburb of Los Angeles. This department is charged with chemical and metallurgical activities. Mr. Stringfield, who is chairman of the Southern California Section of the American Institute of Chemical Engineers, was formerly chief chemist of the local Goodyear plant and was one of the organizers of the Los Angeles Rubber Group.

The name of J. W. Jean of Altadena must be added to the list of those conducting experiments to perfect a satisfactory synthetic rubber. Mr. Jean, who is credited locally with having produced a satisfactory synthetic gasoline, has produced a by-product substance which is being investigated as a rubber substitute. Mr. Jean formerly was a building contractor and went into experimental work in recent years.

William Lean, sales manager for the National Battery Co., Los Angeles, died suddenly on May 25 at the age of 55 as the result of a heart attack. He was well known to members of the rubber industry on the Pacific coast.

"Valencia" and "Pum-Ash" Pumices

Whittaker, Clark & Daniels, Inc., 260 West Broadway, New York City, has announced that through a new subsidiary, the Pumice Corporation of America, it has taken over the production and distribution of "Valencia" pumice from the Barnsdall Corporation which had been mining it at Grants, New Mexico, since 1929. According to the announcement, this domestic product is equal in all respects to the Italian pumice mined on the Isle of Lipari. "Valencia" is said to be a true pumice and not a volcanic ash and is ground and bolted to any specification for rubber use. A new pumice, called "Pum-Ash," has also been brought out by the company to meet the need for a lower-priced product. Although second in quality to "Valencia," the new product is also a true pumice taken from the same mine and processed by the same equipment.

Introduce Rubber-Life

Rubber-Life, a preparation intended to prolong the life of tires, is currently being distributed by Overman & Co., 30 Rockefeller Plaza, New York City. Developed in Europe and brought to this country by two refugees now affiliated with the Belt Oil & Chemical Co., 1265 Broadway, New York City, Rubber-Life is a liquid which, according to descriptive literature issued by Overman, "is free from acids, mineral oils or their by-products, alcohols or any other chemicals which could deteriorate the tires." It is said to be non-inflammable, non-combustible, non-explosive and odorless. According to the supplier, Rubber-Life improves the molecular structure of the rubber, making it harder and more resistant; has a tendency to penetrate the pores of the rubber, combining the rubber particles into a solid mass; and prevents dust and humidity from penetrating the pores. It does not affect the natural qualities of the rubber, such as its elasticity, resilience or other properties. The material is brushed on the tread of the tire only creating a protective surface which is claimed to be good for approximately 500 miles of riding.

Report Progress on Specifications

For the past several months, Sub-Committee V of Technical Committee A of the joint SAE-ASTM Rubber Conservation Committee has been working on the standardization of synthetic rubber specifications. The committee, headed by J. H. Doering of the Ford Motor Co. as chairman and J. V. Hendrick of the Chrysler Corp. as secretary, is composed of representatives from the synthetic rubber, automotive and aircraft industries, and the Army and Navy. A system of classifying current synthetic rubbers by letters and numerals is being worked out while recommendations on testing procedures will be made. The complete report of the committee will appear in an early issue of the *S.A.E. Journal*.

Suggestions for the conservation of rubber in insulated wires and cables are contained in a booklet entitled "Rubber is Essential to Victory," published by the American Steel & Wire Co., Worcester, Mass. The booklet also contains suggested substitutes for rubber-insulated cables and partial substitutions for reductions in rubber usage. Copies are available on request.

APPROVED BY RUBBER CHEMISTS

SOUTHEASTERN CLAY COMPANY, AIKEN, SOUTH CAROLINA

NAMES IN THE NEWS

WILLIAM F. TULEY, sales manager for rubber chemicals and reclaim of the Naugatuck Chemical Division of U. S. Rubber Co., has been named assistant general manager of the ordnance plant U. S. Rubber will operate for the government in Pennsylvania. Other recent appointments in the Naugatuck Chemical Division include that of R. E. NELSON as assistant sales manager for Lotol, Latex and Dispersions Process, Inc., and J. G. COLLINS as sales manager for agricultural chemicals.

V. I. MONTENYOHL, vice-president of the B. F. Goodrich Co. and a member of that organization for thirty-five years, has resigned from the company because of ill health. Since 1928 he served as a director of the company and directed the activities of the International B. F. Goodrich Corp., of which he was president. In recent years he has been responsible for the activities of the Koroseal, chemical sales and traffic divisions of the company, and was president of the Philadelphia Rubber Works Co.

D. F. "DON" CLASH, rubber chemist at the Emeryville, Calif., plant of the General Cable Corp., has been transferred east and will be located at the Pawtucket, R. I., plant. PAUL E. REBE, of the research laboratory at Rome, N. Y., has been transferred to the Emeryville plant as technical superintendent.

L. D. ACKERMAN, formerly chief chemist of the Seamless Rubber Co., New Haven, Conn., more recently doing sales research work for that company, has joined the Converse Rubber Co., Malden, Mass., as technical superintendent, succeeding J. J. SINDLER, resigned.

E. V. ROMAINE, formerly director of technical sales for Newport Industries, Inc., is now manager of technical sales for E. W. Colledge, General Sales Agent, Inc., New York City.

W. A. GIBBONS, director of the general development department of U. S. Rubber Co., was awarded the honorary degree of Doctor of Science by Wesleyan University last month. He received his B.A. degree from Wesleyan in 1910 and his M.A. degree in 1911, obtaining a Ph. D. from Cornell in 1916.

KINGSLEY GILLESPIE, president of the Stamford Rubber Supply Co., Stamford, Conn., has been named editor of the *Stamford Advocate*, a daily newspaper controlled by the Gillespie family. R. M. GILLESPIE has been named technical manager of Stamford Rubber Supply Co.

R. W. MILLER, who has been connected with the Pittsburgh Plate Glass Co. for 12 years, has been appointed manager of the technical service department of the company's Columbia Chemical Division. He succeeds DR. G. L. CUNNINGHAM, resigned.

T. G. HAGENS, associated with the C. P. Hall Co. of Akron for several years, has taken over the duties formerly handled by LESTER BROCK. The latter recently left C. P. Hall to join the sales staff of the Continental Carbon Co.

RALPH D. BERRY, vice-president of the Davol Rubber Co., was elected treasurer of the New England Purchasing Agents Association at the annual meeting of that organization held in Boston on May 11.

ROBERT O. ALEXANDER, for three years development and control chemist in the laboratories of the U. S. Rubber Co. at the Providence, R. I., plant, has resigned to join the Thiokol Corp., Trenton, N. J., as a development chemist.

FRANK R. MAYO, instructor in organic chemistry at the University of Chicago for the past few years, has resigned to join the general laboratories of the U. S. Rubber Co., at Passaic, N. J., as a research chemist.

F. L. CRADDOCK, formerly president of the Mixing Equipment Co., Rochester, N. Y., has been named sales manager of the mixing and processing equipment division of the Edge Moor Iron Works, Inc., Edge Moor, Delaware.

ARTHUR DAVIS, one-time assistant to the president of the Firestone Tire & Rubber Co., and more recently associated with the Electric Household Utilities Corp. of Chicago as treasurer and director, has been appointed controller of the American Steel & Wire Co. He will make his headquarters in Cleveland.

GEORGE C. SHELDON, formerly vice-president of the General Tire & Rubber Co. of Boston, has been appointed general sales manager of the Union Bay State Co., Cambridge, Mass., compounders of industrial cements and coatings. He is a graduate of Bates College and of the Harvard University Graduate School of Business Administration.

RALPH B. SYMONS, who has been associated with the Firestone Rubber & Latex Corp., Fall River, Mass., for some time has been named manager of the product control division of the Nebraska Defense Corp., Fremont, Nebraska.

Emmet Sheahan

EMMET SHEAHAN, general manager of the tire division of the U. S. Rubber Co., has been appointed assistant to F. B. DAVIS, JR., president of the company. CARL A. OSTLING, formerly vice-president of the Carrier Corporation, has joined U. S. Rubber as director of engineering. His immediate assignment is to speed conversion of the company's properties to war work.

Carl A. Ostling

TEMPLE W. TUTWILER, chief engineer of the Cities Service Co. and director of its oil and natural gas operations, has been awarded the degree of Doctor of Laws by the University of Alabama. He is active in the planning and direction of new facilities for the manufacture of synthetic rubber as well as other essential war materials.

ALFONSE PECHUKAS, associated with the Pittsburgh Plate Glass Co. for the past five years, has been named acting director of research of the company's Columbia Chemical Division, succeeding DR. IRVING E. MUSKAT, resigned.

CANADIAN NEWS

The interests of labor on the Board of Directors of the Polymer Corporation, Ltd., will be represented by A. J. Crawford, of Toronto, according to a recent announcement made by Hon. C. D. Howe, Minister of Munitions and Supply. Polymer Corporation is the government-owned company charged with the responsibility of creating a synthetic rubber manufacturing industry in Canada. Mr. Crawford is general organizer for Canada of the Sheet Metal Workers' International Association.

Unofficial reports have placed proposed Canadian annual production at 46,000 short tons of Buna S rubber and 7,300 of butyl. The Polymer Corporation program also encompasses production of 37,000 tons of butadiene and 10,000 tons of styrene, the raw materials for Buna S.

Further tightening of control over the use of reclaimed rubber in the Dominion has been announced by Alan H. Williamson, Controller of Supplies.

Reclaim can no longer be used in the manufacture of: non-essential footwear, soles and heels, or for any quarterlining; sports goods and toys; non-essential drug sundries; non-essential plumbers' supplies; stair treads, flooring, or mats and matting; garden hose; perambulator linings; rubberized fabric for the purse and bag trade, for the raincoat trade, or for automobile topping and upholstery; tractor and farm implement tires and tubes; automobile parts and accessories; tube repair kits; car mats; automobile weather stripping; running board and sill mats and matting; defroster hose; and battery boxes for cars and trucks.

The use of crude rubber for making all of these articles was prohibited some time ago. Immediately, a swing started to the use of reclaim for manufacture of items that could not be made out of crude rubber and this was halted only by an order late in March which froze all stocks of reclaimed rubber for uses other than war items. This action was taken to prevent waste of material until permits could be granted for necessary items. Now, no reclaimed rubber may be used for any purpose unless a permit has been issued by the Controller of Supplies. Permits will be granted for the making of essential products such as standard black lines of footwear, tire repair materials, and jar rings. Amount of reclaim released to any manufacturer for any specific purpose will be limited.

W. H. Male, Toronto, has been appointed deputy to James Stewart, Administrator of Services in the Wartime Prices and Trade Board. Mr. Male is in charge of the program for conserving rubber, gasoline and equipment insofar as it concerns transportation, particularly in the trucking industry.

Mr. Male has been loaned to the W.P.T.B. by Direct-Winters Transport, of which he is general manager. He formerly held a similar position with Colville Transport Company, Ltd., and was previously associated with Gutta Percha and Rubber, Ltd., for twelve years.

Canada's 269,000 commercial trucks are of the utmost importance in the national economy because of the vast expanses of territory in the Dominion which do not have access to railroads. Much of the country's food is handled by motor transport; in Ontario, for example, the Automotive Transport Association estimates that 84% of the meat, 90% of the fresh fruit and vegetables, and practically every drop of milk is trucked to markets. Likewise, trucks hold a place of paramount importance in the industrial picture. Mr. Male's job is to see that these trucks do not stop running.

The program to date is one of voluntary cooperation. Truck owners have been asked to eliminate duplicate operations by pooling services, to reduce the number of deliveries and cut out special deliveries, to eliminate "empty mileage" as much as possible, and to relinquish territory which can be served more economically by other operators. It is expected that 200 million miles of truck travel will be eliminated within the next twelve months through co-operation of the truckers in doubling up, eliminating empty hauls, and in careful scheduling.

All week-end excursions and other luxury bus trips are being eliminated under orders of the Transit Controller. No bus may be operated on an unapproved route and every operator must justify, as essential, all routes which he now operates or intends to operate. New tires and tubes for buses can no longer be obtained without the approval of the Transit Controller.

Hoarding of bicycle tires is no longer possible in the Dominion. A bicycle owner must dispose of his old tire or tube to the National Salvage Committee before he is able to purchase a new tire or tube.

The Barringham Rubber Company, Ltd., Oakville, Ont., is erecting a new building to house equipment for increasing the manufacture of raincoats and other waterproofs from vinyl resins and similar materials other than rubber. The one-story structure is of cement and will be 147 feet by 60 feet in dimension. The increased output is expected to provide employment for fifty additional hands.

Dunlop Tire and Rubber Goods Company, Ltd., has announced that a two and one-half percent dividend has been declared on the five percent cumulative redeemable first preference shares for the half year ending June 30 and will be paid on that date to stockholders of record June 15, 1942.

E. J. Hayes, of Gutta Percha and Rubber, Ltd., has been elected secretary of the Industrial Advertisers Association of Ontario.

The Granby Elastic Web Company reports net earnings of $301,733 in 1941. This compares with $198,329 for the last nine months of 1940, the complete report for 1940 not being available because the company did not undertake public financing until the early part of that year. After provision for income and excess profits taxes, depreciation and other charges, a net profit of $64,390 was available on the capital shares. Preferred dividends amounting to $26,620 were paid, leaving a balance equivalent to $1.25 a share on the common stock. The balance sheet as of December 31, 1941, shows current assets of $647,370 and liabilities of $307,747, leaving a net working capital of $339,623.

In his annual report, Horace Boivin, president of the company, stated that rubber restrictions have largely curtailed normal production of elastic web. He added further, however, that "the company has been fortunate in obtaining a considerable amount of business which is contributory to Canada's war effort, and under these circumstances rubber restrictions should not materially affect the earnings of the company." Principal war items made by the company include web equipment for packsacks and haversacks, camouflage nets, and other canvas articles required by the armed forces.

Imports of crude rubber into Canada in March, 1942, amounted to 11,440,796 pounds compared with 8,692,314 pounds for the same month in the previous year. In spite of this increase, the total crude rubber imports for the first quarter of 1942 were only 21,500,479 pounds compared with 31,232,217 for the first quarter of 1940, a decrease of 31.2 percent.

Wall cards on the care of rubber hose have been made available by the Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, N. J. One is devoted to the proper care of fire hose and the other lists rules for the care of air, water, steam and other types of hose and for proper attaching of couplings. The cards are 8¾ x 11 inches in size.

OBITUARIES

William H. Stiles

William H. Stiles, sales manager of Hecht, Levis & Kahn, Inc., died at his home, 12 Clark Street, Brooklyn, N. Y., at the age of 64, on May 21.

Associated with the crude rubber trade for more than thirty-five years, Mr. Stiles entered the business as a member of the firm of Robinson & Stiles, importers, in March, 1906. This firm was dissolved in 1908 and he started business alone as a broker.

In 1919 he formed an organization with Lynn V. Stiles and Gordon Milne under the name of William H. Stiles & Co., this firm being succeeded in 1925 by Schmoll, Stiles, Reid, Inc. Mr. Stiles withdrew from the latter organization in June, 1927, and became an importer on his own. About April, 1932, he also began to operate as a broker and continued in this dual capacity until May 18, 1936, when he joined Hecht, Levis & Kahn, Inc.

Mr. Stiles was a member of the Commodities Exchange and the Rubber Trade Association of New York. His social activities included membership in the Montauk Lodge, F. & A. M., and the North Fork Country Club. He leaves a widow and a son.

Cary D. Waters

Cary D. Waters, president of the C. J. Tagliabue Mfg. Co., Brooklyn, N. Y., died at his home, 1306 Albemarle Road, in Brooklyn, at the age of 58, on May 9. Born in Norwich, N. Y., in 1883, Mr. Waters was educated at Hamilton and Pratt Institutes in Brooklyn and was graduated from New York University in 1904. He began his career as superintendent of the Empire Pipe Corporation of Brooklyn and became its president in 1908, remaining in that post until the company was dissolved in 1938. He had also been president of the Tagliabue concern for the past twenty years. Mr. Waters was very active in borough civics and served as president of the Brooklyn Chamber of Commerce from 1936 to 1940. He was also very active in banking circles. A widow and two daughters survive.

Paul M. Aultman

Paul M. Aultman, technical superintendent of the Sun Rubber Co., Barberton, Ohio, for the past five years, died at City Hospital in Akron on May 14 as a result of embolitis following an apparently successful operation. He had been a patient at the hospital for two weeks and was to have been discharged the following day. He was 50 years of age.

Born in Shanesville, Ohio, on March 28, 1892, Mr. Aultman was graduated from the University of Michigan in 1914. Before entering the rubber industry he taught science in Boyne City, Michigan, for a few years. Prior to joining Sun Rubber he had been connected with Republic Rubber, Rubber Service Laboratories of Monsanto Chemical, Goodyear, Mason Tire & Rubber, and Pennsylvania Rubber. He acted as chief chemist for both Republic and Mason, and was in charge of the laboratory for Monsanto.

Mr. Aultman was a Mason and also a member of the Akron Rubber Group. Funeral services were held in Akron on May 17 with cremation in Cleveland. A widow survives.

Max Kalter

Max Kalter, president of the Servus Rubber Co., Rock Island, Ill., died at his home, 239 Central Park West, New York City, at the age of 64, on May 17. Long associated with the rubber footwear trade, Mr. Kalter was also active in other industries, acting as treasurer of the General Furniture Co., of Chicago, and a director of the Pierce Butler Radiator Corp., of Syracuse, N. Y. Mr. Kalter served with the American forces in the Spanish-American War and with those of the English in the Boer War. He was a member of the New York Athletic Club, the Temple Israel of New York, and the New York Chamber of Commerce. He leaves a widow.

Data on Reclaim Compounds

The Rubber Chemicals Division of E. I. du Pont de Nemours & Co., Inc., Wilmington, Delaware, has made available several technical bulletins on various reclaim compounds, including the following: (1) Reclaimed Rubber Erasers; (2) All Reclaimed Rubber Compound for Light Colored Molded Items; (3) All Reclaim Footwear Stocks; (4) All Reclaim Sponge; (5) A Brick-Red Colored All Reclaimed Rubber Stock Suitable for Bulbs and Hollow Balls. Copies of the bulletins are available on request to the company.

DR. A. E. MACGEE, manager of the Skellysolve and Skellyfuel Division of the Skelly Oil Co., Kansas City, Mo., who is a Lieutenant Commander in the Naval Reserve, has been ordered to active duty in the Bureau of Ships at Washington, D. C. He served with the First Division in France and Germany in the last war.

Goodrich Pneumatic Life Belt

The new type pneumatic life belt, developed by the B. F. Goodrich Co., Akron, is shown above in inflated form. In this form, the belt will support a man with full equipment for protracted periods. The belt weighs little more than two pounds. Pressure on two small containers in the belt instantly release gas which automatically renders the device ready for service. Pressure in the belt can be raised orally by blowing into two sections of hose attached to it.

IN THE SERVICE

ROBERT A. ENGEL, manager of the industrial chemicals department of Givaudan-Delawanna, Inc., manufacturers of aromatic chemicals, has accepted a position with the U. S. Army Chemical Warfare Service Planning Division and is now located in the New York office of that agency.

F. J. MAYWALD, JR., consulting chemist, until recently associated with the Allied Latex Corp., East Newark, N. J., as chief chemist, is now serving as assistant signal officer of the First Interceptor Command at Mitchel Field, Long Island, N. Y. He holds the rank of captain.

MAX F. MOYER, assistant manager of the flooring sales department of the Goodyear Tire & Rubber Co., has been appointed a major in the Army Air Corps. He reported to the San Antonio, Texas, Air Service Command on May 23.

JAMES W. FERGUSON, JR., for the past three years a special representative of the B. F. Goodrich Co. in Washington, D. C., has entered the U. S. Navy. He is a graduate of Virginia Military Institute and the U. S. Naval Academy.

RUBBER SULPHURS

COMMERCIAL RUBBERMAKERS' SULPHUR
Tire Brand, 99½% Pure

REFINED RUBBERMAKERS' SULPHUR
Tube Brand, 100% Pure

•

CRYSTEX (INSOLUBLE) SULPHUR

•

SULPHUR CHLORIDE
CAUSTIC SODA
CARBON BISULPHIDE
CARBON TETRACHLORIDE

Stauffer

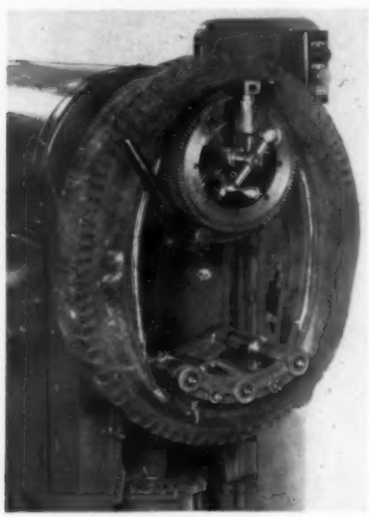
Stauffer Chemical Co.

420 LEXINGTON AVE., NEW YORK, N. Y.
230 NO. MICH. AVE., CHICAGO, ILL.
624 CALIFORNIA ST., SAN FRANCISCO, CAL.
555 SO. FLOWER ST., LOS ANGELES, CAL.
424 OHIO BUILDING, AKRON, OHIO
FREEPORT, TEXAS APOPKA, FLORIDA

NEW EQUIPMENT

Improved Black Rock Debeading Equipment

About a year ago the Black Rock Manufacturing Co., Bridgeport, Conn., introduced a tire debeading unit, consisting of two machines—a cutter and puller (see RUBBER AGE, August, 1941, pp. 348-49)—designed to yield a 10% increase in tire scrap by the simple expedient of saving the entire bead, part of which is wasted in ordinary reclaiming methods. Considerable improvements have been built into this equipment since the original model was produced by Black Rock and the improved equipment was recently demonstrated at the company's Bridgeport plant.



The Improved Cutting Equipment

The improved equipment provides increased speed and greater accuracy of operation which is as follows: The used tire is placed in position on the cutter, resting on the cutter head and held in position by steel guides. A tensioning device then draws the tire taut and two sharp cutting knives, one on each side, move into position against the bead, the tire then being revolved until the cutting cycle is completed. The entire operation, other than putting the tire into position, is automatic, and the position of the knives and the depth of the cut are instantly adjustable. The knives cut through the rubber and fabric of the bead reaching to but not through the wire. The cutter is so constructed that removal of panels on either side enable quick and easy repair and cleaning of working parts.

After the tire has been subjected to the cutting operation, it is shifted to the puller where it is quickly clamped to a flat surface, a hook inserted under the bead wire, and the wire removed as the hook is put into motion. Since the wire is cleanly removed in this operation, it has definite value as scrap in its own right. Use of the debeading equipment has indicated that it will handle tires of all kinds and sizes irrespec-

Research's Contribution to the Rubber Industry

15 of a series of timely suggestions for solving war-time problems

You may find the answer to your problems in the following list:

Rubber goods finish of high lustre and flexibility resistant to gasoline. (129)

Raw rubber sheets can be prevented from sticking together by means of a water dispersion of a synthetic wax-like material. This dispersion can also be used as a lubricant in the cutting of rubber gaskets. (150)

The adhesion of rubber to cloth on vulcanization can be increased by the addition of a chemical material to the raw rubber mix. (151)

Plastic and hard rubber articles can be polished by the tumbler barrel method by means of a hard, white, synthetic wax which effectively replaces carnauba wax at a much lower cost. (168)

Synthetic rubber can be plasticized by means of an ester which is readily available. (184)

Urea formaldehyde resins are plasticized and lubricated by new water dispersible waxes which are incorporated in the aqueous phase. (165)

Carnauba wax can be replaced as a lubricant for molding thermosetting plastics by a synthetic wax now available in powdered form. (172)

Wax which will not melt in boiling water. (110)

Substitutes for imported waxes such as Montan wax, Ozokerite, Japan wax, etc. now available. (114)

Synthetic oils dispersible in water that do not contain soap, or added emulsifiers. (121)

Emulsifying agent for emulsions stable to strong acids, salts and other electrolytes. (122)

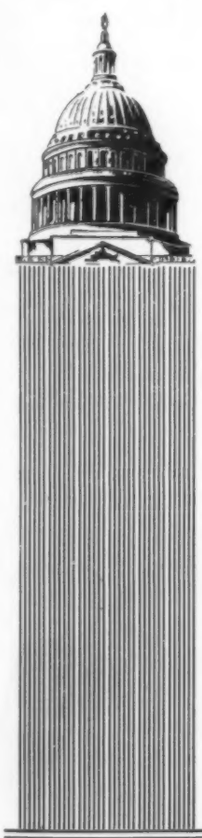
Defoaming agent for casein, glue, gelatine, shellac and similar products. (130)

Glycerin substitutes meeting specific requirements are now commercially available. (175)

Lanolin for industrial purposes can be replaced by a new compound made from domestic raw materials. (178)

A liquid foam producer to replace Saponin for industrial purposes, is now being offered. (181)

See number in parenthesis after each subject. Jot down and mail to us any number that interests you. We will send you data sheets about the chemicals and their uses. Answers to many other problems in your industry are given in our 112 page manual "Chemicals by Glyco"—which is yours for the asking. GLYCO PRODUCTS CO., INC., 230 King Street, Dept. 52, Brooklyn, N. Y.



Reduce Your Purchases of VITAL Cotton Fabrics!

★

Use the CAPITOL PROCESS LINER TREATMENT

IT is *vital* in our total war effort to conserve stocks of cotton piece goods. Rubber manufacturers are urged to use Treated Liners to prolong the life of their fabrics, thus decreasing the necessary amount of textile purchases.

The CAPITOL Process of Liner Treatment is an *economical* and *efficient* means of rendering cotton piece goods repellent to adhesion of rubber stocks. It is low in cost and adds long life to fabrics.

Should your stocks require no *specially treated* liners to prevent adhesion, our processing of the fabrics you now use will lengthen the duration of their usefulness many times over and create an important reduction in your annual purchases of vital piece goods.

★

TEXTILE PROOFERS, INC.

One Gates Ave., Jersey City, N. J.

The Sensational New

VULCANIZER INTERIOR PAINT

WILL RESIST
- ACID ACTION
- ABRASION
- HEAT
- OXIDATION

SAVE YOUR VULCANIZERS with *Bonnejohn Vulcanizer Interior Paint* an insoluble coating that gives lasting protection to fittings and vulcanizer interior surfaces.

Its formula represents the results of scientific experiments and contains materials that minimize sulphurous fumes and acid action as well as being anti-corrosive under high steam pressure.

Can be applied with a brush, spreads easily, has exceptional long lasting and adhesive qualities, seals perfectly requiring no preliminary preparation other than having surfaces clean before painting.

Recommended for carts, hangers, and door mechanism or any equipment used in the interior of vulcanizers, or any place in your plant where equipment needs protection against extreme corrosion.

Comes in black only .....$9.75 per gallon.

BELKE MANUFACTURING CO.
947 N. CICERO AVE. CHICAGO

tive of age. Only in rare cases is the bead so rusted or corroded as to bar quick removal.

As shown by the recent demonstration at the Black Rock plant, the improved debeading equipment, in addition to saving heretofore wasted scrap in appreciable

The Improved Pulling Equipment

volume, is a labor saving device. From three to four tires may be cut and debeaded per minute. It would ordinarily be useful equipment in any reclaiming plant, but in these days when the need for scrap is so urgent it commands especial attention.

Solder-Sealed Condenser Bushings

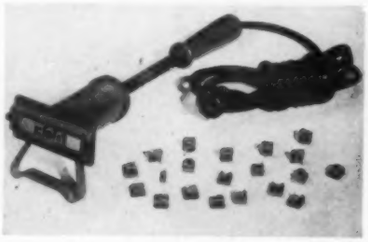
New condenser bushings sealed with solder for use with power transformers and oil circuit breakers have been announced by the Westinghouse Electric & Mfg. Co., East Pittsburgh, Penna. Solder-sealing—an exclusive Westinghouse development—cuts down the maintenance costs by eliminating gaskets, and adds a third and absolute defense against moisture. Moisture-proof condenser bushings with ratings of from 15 to 69 kilovolts are now solder-sealed in a porcelain weather case that is vacuum-tight and permanent.

To give the bushings a high safety factor and small physical dimensions, especially prepared Micarta paper is wrapped on the copper lead of the condenser and a layer of electrolytic copper foil is wound on at regular intervals to form the condenser. Under operating conditions, the voltage gradient—radially through the insulation; longitudinally, over the surface of the condenser—is practically uniform.

After assembly the bushings are given air tests at 30 pounds internal pressure, and other tests.

Master Tire Branding Equipment

The Master Manufacturing Co., 1400 West Fulton St., Chicago, Ill., has introduced several tire branding outfits, the one illustrated herewith being the Master No. 1-T Electric Outfit. The branding torch in this



outfit has been designed to meet the present demand for a sturdy, compact unit that would allow letters to be quickly changed. The torch is 14 inches long, weighs 2½ pounds, has a face of 3¾ x 1¾ inches, with a 3-inch slot, that will accommodate seven ½-inch letters. The elements in the torch, made from nichrome wire, insulated and baked, are replaceable. The outfit described is intended for light-duty passenger car tires. An outfit for truck and heavy-duty passenger cars is also available.

Premier Laboratory Colloid Mill

One of the latest developments of the Premier Mill Corp., 110 East 42nd St., New York, N. Y., is the Premier Laboratory Colloid Mill No. 200 with 2-Inch Rotor. It is intended for every type of laboratory work involving emulsions, dispersions, wet mixing, and blending of solids, liquids and pastes. The mill, with attached hopper, is driven by a 1½ h.p. Universal type motor with maximum speed of 13,500 r.p.m. Like the larger production units made by the company, the mill can be accurately adjusted to operate at a clearance of .002-inch and upwards between the rotor and stator, insuring uniform quality and particle sizes of one micron and less. Premier mills operate on the principle of a hydraulic shearing action within the confines of a very thin film of liquid. This action takes place in the clearance between the rotor and stator. The new laboratory mill, which has a capacity of 10 to 75 gallons per hour depending on the viscosity of materials treated, is 18½ inches high and 8½ inches wide.

BRIEFS . . . .

The **Midget Booster,** a new piece of equipment designed to meet any unusually severe conditions of static electricity which may arise as a result of the speeding up of machines processing defense materials, such as acetate rayon and nylon, has been introduced by the Simco Co., 4929 York Road, Philadelphia, Penna.

A **Portable Wheelabrator** for the blast room, an entirely new development in the field of airless abrasive blast cleaning, has been announced by the American Foundry Equipment Co., Mishawaka, Indiana. Typical applications include such work as lathe beds, flywheels, gears, pulleys and valves.

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REVIEWS

BOOKS

Vanderbilt Rubber Handbook. (8th Edition). Edited by J. M. Ball. Published by R. T. Vanderbilt Co., 230 Park Ave., New York, N. Y. 5⅜ x 8¼ in. 464 pp.

The Vanderbilt Handbook has grown in scope and size with each successive edition until now in the eighth edition it has attained the proportions of a textbook of American rubber technology, with Vanderbilt materials used for purposes of illustration.

The handbook has been brought out at a time when the rubber industry is in a state of more rapid flux than ever before in its history. In the present emergency the revised handbook will be especially in demand because it contains the first comprehensive compilation of information on the compounding and processing of the newer synthetic rubbers, as well as the non-vulcanizable rubber-like materials, chemical derivatives of rubber, and reclaim used alone. Much of this information may be outmoded in the not distant future but its value and importance at the present time outweigh any long term consideration.

A number of well-known technical men collaborated with the staff of the Vanderbilt company in preparing the handbook. About twenty contributed articles bear the names of the authors who represent nearly as many different firms.

The handbook is made up of four main sections which are conveniently distinguished by the use of paper of different colors: I. Compounding; II. Vanderbilt Materials; III. General Articles and Test Methods; and IV. Tables and Charts.

The first and largest section gives a detailed account of the principles and practice of making rubber compounds from natural rubber, synthetic rubber, reclaim, and latex. The synthetic rubbers treated are Hycar O.R., Chemigum I, Perbunan, Buna S, the neoprenes, and the Thiokols. Four non-vulcanizable rubber-like materials, Vistanex, Polyvinyl Alcohol, Koroseal, and A.X.F., are also treated. The omission of any reference to Butyl rubber could scarcely have been an oversight, but was presumably dictated by considerations arising from the war.

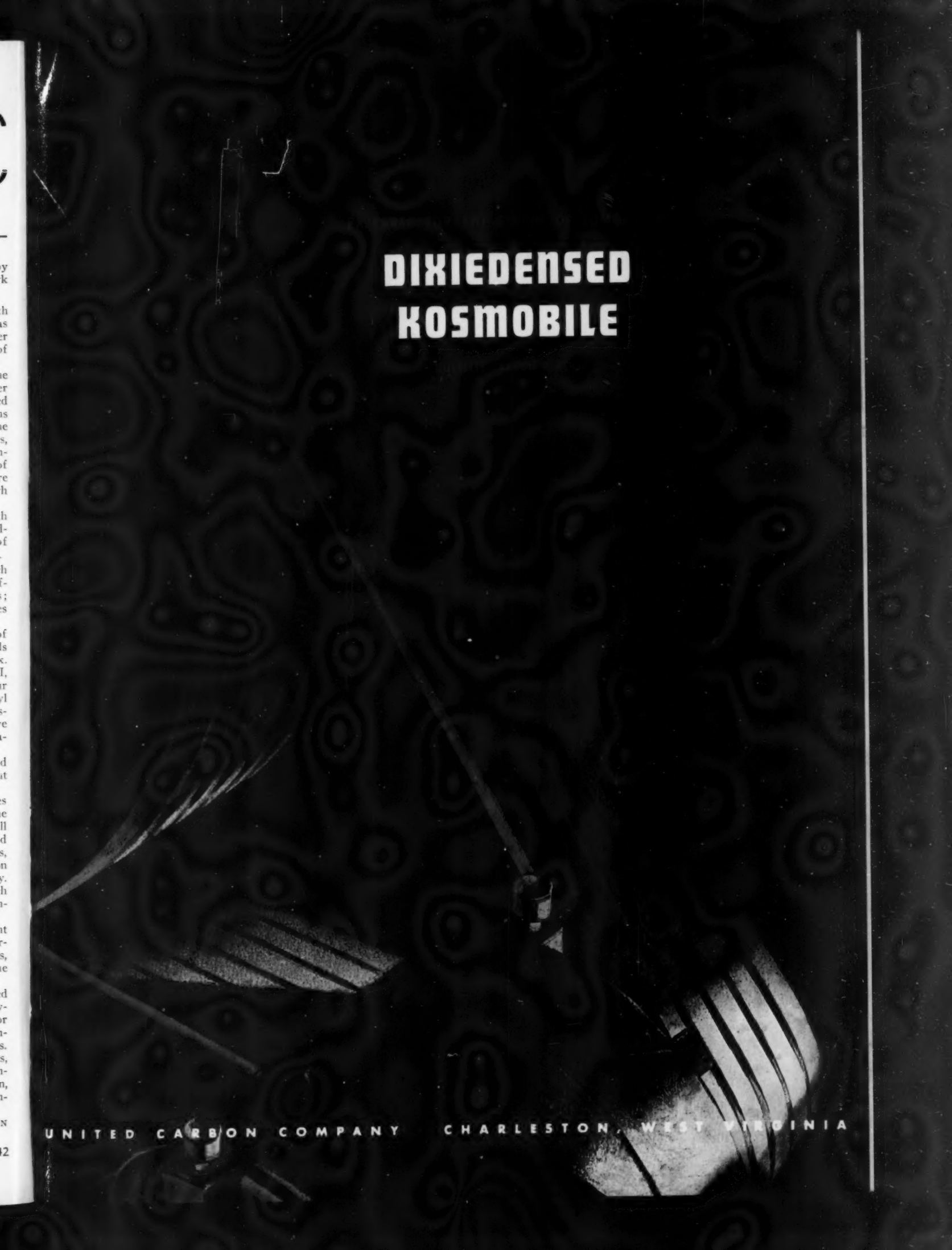
The Vanderbilt materials, now numbering 65, are treated in a concise tabular summary which occupies only about 5 per cent of the handbook.

The third section of the handbook contains a few articles on topics of general interest but is given over largely to the description of the different tests used by the industry. All important items of testing equipment are illustrated, and especial attention is paid to some of the less common tests, such as that for accelerated aging in light. The articles on aging and electrical testing have been expanded considerably. Applications of X-ray methods to rubber testing and research are enumerated and a brief description is given of an important new tool, the electron microscope.

The final section on tables and charts has been brought up to date as regards materials used by the industry. Otherwise it is much the same useful compilation of formulas, conversion factors, statistics, facts, and figures as in the previous editions.

The foreword states that the handbook has been prepared primarily for new men coming into the industry. It is, however, much more than an educational publication for junior men; it is a reference work of value to all ranks in the industry from the compounders and chemists to the executives. Outside the rubber industry it will prove useful to students, materials engineers, and many others who may require a compact source of practical information about the composition, manufacture, and testing of rubber, both natural and synthetic.

A. T. McPherson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Rationed Rubber and What to Do About It. By Williams Haynes and Ernst A. Hauser. Published by Alfred A. Knopf, 501 Madison Ave., New York, N. Y. 5 x 7½ in. 180 pp. $1.75.

This is an excellent review of the reasons which lie behind the necessity for rationing rubber in the United States and others of the United Nations. Written by an acknowledged expert in the rubber field and a widely-known author, lecturer and publisher in the chemical field, the book is both factual and readable.

The authors do not seek to place the blame for the drastic rubber shortage which made rationing inevitable on any one person or group of persons. They take the viewpoint that government officials, too, are only human and could not conceive of vast Japanese victories which would put 92% of productive capacity of crude rubber in the hands of that little nation in so short a time. The economics of rubber in the pre-war period, they state, were definitely against a large synthetic rubber program.

The book is both topical and timely, exceedingly timely. Plans for the cultivation of rubber from guayule, poinsettia, rabbit bush, *Kok-Sagyz*, milkweed and other plants, in the United States are discussed and the impracticality of securing large regular yields from any of these plants in time to be of value in the war effort is pointed out. Reclaimed rubber is called our "first line of defense" and the history of the industry is traced. The statement that the reclaim industry could produce 325,000 tons of reclaim in 1942 is made, with the qualifying provision that sufficient scrap is collectible.

Synthetic rubber, of course, comes in for considerable discussion. Only synthetic rubber can supply the United Nations with a positive supply of rubber in the next few years, the authors state, and although there are still many unsolved problems the right answers will be found "not by congressmen and journalists, but by chemists and engineers." The chapter on synthetic rubber, which includes a defense of Standard Oil's position with regard to its pre-war contracts with I. G. Farbenindustrie, concludes with a prediction that "after the war we shall have better and cheaper tires."

The final chapter in the book is devoted to "How to Conserve Rubber Goods." Conservation is placed directly in the lap of "the good citizen." He can help greatly in two ways, first by helping to increase the stock of reclaimed rubber by getting every available scrap, especially discarded tires and tubes, into the hands of the local junk dealer, by both word and deed, and second, by precept and practice, he can help stretch present working rubber to the utmost by caring for his own rubber and using it economically and most efficiently. Suggestions for carefully preserving rubber now in use are given.

A close reading of *Rationed Rubber* indicates that the authors very carefully checked all figures and statistics used. In only one instance does a flagrant error appear. In discussing the rubber content of guayule they put the yield at the end of five years at 1800 *short tons* of dry rubber per acre instead of 1800 *pounds*. Would that the former figure were accurate!

•

Rubber and Composition Machinery: 1942. Stewart Bolling & Co., Inc., 3190 East 65th St., Cleveland, Ohio. 8½ x 11 in. 24 pp.

This booklet contains illustrations and descriptions of various new and rebuilt equipment shipped by Stewart Bolling during the past year or so to the rubber and other industries. Practically all of the equipment was earmarked for defense work. Included were bale cutters, mills, calenders and presses. One section of the booklet is devoted to the new ring and semi-ring type presses developed by the company, the first of which were built in 1933. Since that time the firm has built ten different sizes in a variety of forms ranging in tonnage from 250 to 3,500 tons in single cylinder presses.

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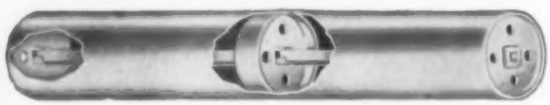

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REVIEWS (CONT'D)

The Recovery of Vapors. By Clarke Shove Robinson. Published by Reinhold Publishing Corp., 330 West 42nd St., New York, N. Y. 6 x 9 in. 273 pp. $4.75.

Interest in the subject of the recovery of volatile solvents has grown very considerably since publication of the book on that subject by the same author almost twenty years ago. The current book brings the subject matter of the earlier one up-to-date but goes further in that it includes other material in the wider field of vapors in general. The commercial recovery of vapors is of relatively recent origin.

The author has practically omitted two phases of great importance in the operation of solvent recovery plants, *i.e.*, the evaporation of the solvent from the material in which it has been used and the subsequent fractional distillation of the recovered solvent to separate it from the absorbing liquid or other substances present and to purify it for reuse, since, as he states in his preface, both of these phases are specialized operations of the first magnitude deserving separate treatises and both have been covered in other books. The present work should be considered as a course of study in the basic theory of the recovery of vapors for the benefit of engineers and others who find that they need elementary information on the subject.

Referring to the fact that the rubber industry has been one of the most prominent users of solvent recovery, both by means of carbon adsorption and by the older methods, the author devotes two pages to a description of a typical recovery process in a rubber factory. In addition, some space is devoted to the design and operation of laboratory apparatus devised and used by the author for the purpose of drying thin films of rubber and other materials to determine the rate of evaporation of solvents. A brief description of the solvent recovery unit recently installed by Goodrich at its Koroseal spreading plant is also included. This unit is believed to be the largest in the United States.

The book has 26 chapters, is profusely illustrated with charts, diagrams and photographs of actual installations, and has a complete subject index. Tables on "Explosive Limits of Vapor-Air Mixtures at Room Temperature and Pressure" and "Vaporization Data for Various Solvents" are given in an appendix.

•

New International Year Book: 1941. Edited by Charles Earle Funk. Published by the Funk & Wagnalls Co., 354 Fourth Ave., New York, N. Y. 7 x 10 in. 766 pp. $5.30 (cloth binding).

This latest compendium of the world's progress covers that for the year of 1941. War is definitely the keynote in the volume, since few fields of endeavor have been left unscathed by the total all-out effort waged by the United Nations and the Axis powers. Even the few remaining so-called neutral countries are directly affected. As with previous editions of this valuable reference work, the topics covered are alphabetically listed, each under logical key-words, but with copious guiding cross-references. Wherever possible, coverage of any field, industry or topic has been placed in the hands of some authority familiar with the subject. The format of the book has been slightly altered so that legibility and visual appeal is improved. Some variety in the illustrative matter has also been introduced. As in the past few editions, the data on rubber has been contributed by M. E. Lerner, Editor of RUBBER AGE.

•

First Aid to Industry in Conserving Rubber. U. S. Rubber Co., 1230 Sixth Ave., New York, N. Y. 6 x 9 in. 48 pp.

Complete and explicit suggestions for the proper care of industrial rubber goods, including hose, belts, packings, tapes, wires and cables, mountings, mats and matting, and rubber-lined equipment, are given in this booklet. Conservation methods outlined range from initial design of the rubber products through inventory and storage to use, maintenance, inspection and repair. This is one of the most complete books on rubber conservation yet published.

Photomicrography. By R. M. Allen. Published by D. Van Nostrand Co., Inc., 250 Fourth Ave., New York, N. Y. 6 x 9 in. 369 pp. $5.50.

This is the first authoritative reference book on the subject of photomicrography. Written by a recognized authority, it discusses fundamental principles, describes modern photomicrographic equipment and the use of home-made equipment, outlines techniques of regular and special processes, and includes a selection of 50 photomicrographs with the exposure data for each. The text has been so edited that the initiated can turn direct to matters of special interest while the beginner can follow through each chapter in the sequence presented absorbing data essential to practical technique. A chapter on photographic processes is included to provide information on this phase for those who may not have had previous experience with them.

BOOKLETS, CATALOGS, Etc.

Perbunan Compounding and Processing. Chemical Products Department, Stanco Distributors, Inc., 26 Broadway, New York, N. Y. 8½ x 11 in. 36 pp.

Considerable data on the compounding and processing of Perbunan, the oil-resisting type of Buna, sometimes referred to as Buna N, is contained in this technical booklet. Mixing, extrusion, calendering, cements and buildings operations are discussed. Specific properties of the material are given. Formulas for ten different stocks, together with test data on each, are included. Of special interest is the inclusion of a table showing the effects of 35 different softeners on Perbunan and another showing the effects of various pigments, including various grades of black, clay, zinc oxide, blanc fixe, and whiting, as regards time, elongation, modulus and hardness. A table showing the effect of various accelerator combinations in a 50-part channel black Perbunan base compound is also given. Some space is devoted to a discussion of mixtures of Perbunan with rubber and other polymers.

•

Compounding of Buna S. R. T. Vanderbilt Co., 230 Park Ave., New York, N. Y. 8½ x 11 in. 8 pp.

This report concerns laboratory work and observations on the compounding of Buna S. Data is given on tensile properties, stress-strain, impact resilience, Shore hardness, and tear resistance for two Buna S compounds and is shown in comparison with that from a natural rubber compound. A carbon black compound suitable for tire treads or other molded items requiring similar physical properties was used. One of the Buna S compounds contained normal sulfur and the other was sulfurless. General information on processing, compounding, loading and vulcanization is included.

•

Accelerator Z-51. Advance Solvents & Chemical Corp., 245 Fifth Ave., New York, N. Y. 8½ x 11 in. 25 pp.

The preparation, properties and advantages of Accelerator Z-51, a dithiocarbamate salt made from an entirely new base, are outlined in this booklet. Complete physical properties are given. Data on the use of the new accelerator, not only as a primary accelerator but also in combination with Altax, is included. The booklet also lists the curing rates at 220° F. for various dosages of Accelerator Z-51 alone and of combinations with Altax. Data on pure gum, clay-loaded, and carbon black stocks is given as is data on synthetic rubber (Perbunan) and 100% reclaim stocks.

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A 16-page informative booklet published by the American Foundry Equipment Co., Mishawaka, Indiana, answers every question about the **Airless Wheelabrator,** the mechanical unit that utilizes controlled centrifugal force, instead of compressed air, for abrasive blasting.

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NEW YORK, JUNE 13, 1942

Crude Rubber

EFFORTS to attract rubber from Latin American countries, the only remaining sources of supply other than Africa, Ceylon and India, continue. That a special drive is afoot to secure wild rubber from these countries by more intensive efforts was seen in the appointment of John W. Bicknell, plantation manager of U. S. Rubber, as a vice-president of the Rubber Reserve Co. Mr. Bicknell will be in charge of wild rubber. Rubber Reserve is known to be expanding its personnel considerably in the expectation of handling a greater flow of rubber.

The industry was also greatly interested in movements launched by two of the large rubber companies—U. S. Rubber and Goodrich—designed to investigate the possibilities of securing rubber from some of the thousands of domestic plants known to contain some rubber in their systems. U. S. Rubber put Dr. John McGavack at the helm of its wild rubber research, while Goodrich appointed Harlan Trumbull to a similar post.

The U. S. Rubber investigation came to light when the company announced that it was furthering its investigation by leasing an experimental plantation near Yuma, Arizona. A complete field laboratory is being established at the plantation and the rubber content of the various plants will be determined by X-ray diffraction patterns. Goodrich, in addition to its own investigation, is also cooperating with Cornell University at Ithaca, N. Y., in the study recently undertaken by that university to determine the rubber potential of domestic plants.

In the meantime, considerable progress on the Emergency Guayule Rubber Project, which is in the hands of the Forest Service of the Department of Agriculture, is reported. Practically all of the seedlings purchased from the Intercontinental Rubber Co. have already been used, both in nursery beds and in field planting. Major Kelley, in charge of the project at Salinas, Calif., is well pleased with the progress to date.

According to some quarters the crude rubber stockpile is now around 750,000 tons, and is expected to decline steadily as military demands increase. Quotations below are those set by the Rubber Reserve Co.

As of June 13

Fixed Government Prices

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Ribbed Smoked Sheets—

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No. 4	—	@	.21¾
Thin Latex Crepe	—	@	.23 1/16
Thick Latex Crepe	—	@	.23 1/16
Brown Crepe, No. 1	—	@	.21 15/16
Brown Crepe, No. 2	—	@	.21 1/16
Amber Crepe, No. 2	—	@	.21 15/16
Amber Crepe, No. 3	—	@	.21 1/16
Brown Crepe, Rolled	—	@	.17 1/16

Latex—

Normal, carload lots, tanks	—	@	.2595
Normal, carload lots, drums	—	@	.2825
Conc., carload lots, tanks	—	@	.2765
Conc., carload lots, drums	—	@	.2950

Outside Market Prices

Paras—

Up-River, fine	—	@	—
Acre Bolivian, fine	—	@	—

Balata—

Brazilian block	—	@	—

Scrap Rubber

Because of the many conflicting estimates on the amount of collectible scrap rubber available and the growing need for the material by reclaimers, which scrap rubber dealers were hard put to meet, a nation-wide collection drive was announced on June 12. Because a fairly large amount of run-of-the-mill scrap is anticipated, dealers will be busy in months to come sorting and grading the collections which are being handled by the nation's gas filling stations. Most dealers are cautious as to the possible amount which may be collected but agree enough should come in to solve the immediate supply problem. Prices shown are ceilings:

(Prices to Consumers, Delivered Akron)

Mixed passenger tires	ton	18.00
Beadless passenger tires	ton	24.00
Passenger S.A.G.	ton	18.50
Mixed truck tires	ton	18.00
Beadless truck tires	ton	24.00
No. 1 truck S.A.G.	ton	16.50
No. 2 truck S.A.G.	ton	16.50
No. 1 passenger peelings	ton	47.50
No. 2 passenger peelings	ton	30.00
No. 3 passenger peelings	ton	27.50
No. 1 truck peelings	ton	47.50
No. 1A truck peelings	ton	50.00
No. 2 truck peelings	ton	30.00
No. 3 truck peelings	ton	27.50
No. 1 light colored carcass	ton	52.50
No. 2 light colored carcass	ton	50.00
Gray carcass	ton	47.50
No. 2 passenger tubes	lb.	.07¼
No. 2 passenger tubes, lt. col.	lb.	.08¼
Red passenger tubes	lb.	.07½
Black passenger tubes	lb.	.06¾
Mixed passenger tubes	lb.	.06¾
No. 2 truck tubes	lb.	.07½
Red truck tubes	lb.	.07¼
Black truck tubes	lb.	.05¼
Two-toned black-gold tubes	lb.	.06¾
Two-toned red-black tubes	lb.	.06½

Tire Fabrics

The situation in the tire fabric field remains unchanged, with practically no demand for such fabrics. Consequently, prices are nominal and in many quarters are not even being quoted. The prices shown below are those which were in force on or about January 15.

(Prices Net at the Mill)

Peeler, carded, 23/5/3	lb.	.43½ @	.44
Peeler, carded, 23/4/3	lb.	.44½ @	.45
Peeler, carded, 15/3/3	lb.	.41½ @	.42
Peeler, carded, 15/4/2	lb.	.41½ @	.42
Peeler, carded, 13/3/3	lb.	.40½ @	.41

CHAFERS

Carded, American, 1 1/16"	lb.	.43½ @	.44
Carded, American, 1"	lb.	.39½ @	.48

Sheetings

48x40	36 in.	5.50	lb.	—	@ 7.818
40x40	36 in.	6.15	lb.	—	@ 6.991
40x36	36 in.	6.50	lb.	—	@ 6.615
48x48	40 in.	2.50	lb.	—	@16.200
48x48	40 in.	2.85	lb.	—	@14.210
56x60	40 in.	3.60	lb.	—	@11.944
48x44	40 in.	3.75	lb.	—	@11.066

Note: Prices shown above are ceiling prices set by order of the O.P.A. Quotations are based on an average price of 15-16-inch middling cotton of 20.37c at the ten designated southern markets.

Cotton

The price for spot cotton on the Exchange has moved in a wide 200-point range within the past thirty days, dropping from a high of 21.14 on May 15 to a low of 19.13 on June 8. Prices held fairly steady around 21 cents in mid-May and then began a slow but steady downward movement largely attributed to Washington's countless rumors. The pace of liquidation was greatly accelerated early this month when President Roosevelt issued his order authorizing imports of materials needed for war purposes free of duty. Reaction of the market was termed more psychological than anything else since cotton is not an import commodity. The drop, however, was indicative of the nervous state of the market. In the past few days there has been a great deal of liquidation due to the market's willingness to listen to talk of an early peace and at this writing (June 13) the market continues weak. Quotations for middling uplands on the Exchange follow:

	May 11	June 13		
	Close	High	Low	Close
July	19.53	18.16	17.96	18.08
October	19.83	18.47	18.28	18.36
December	....	18.58	18.40	18.50

Reclaimed Rubber

Demand for reclaim continues strong but the supply problem has reached a point where several reclaimers have been obliged to discontinue certain grades of reclaim for the present. The entire supply currently available is said to be only about four months but reclaimers are hopeful that the recently-announced nation-wide scrap rubber drive will produce the desired results. Reclaimers report that they are using more low grade scrap that at any time in the past and they expect that a heavy portion of the scrap collected in the current drive will be run-of-the-mill scrap. Prices shown below are ceilings:

Shoe

Unwashed	lb.	.07	@	.07¼

Tube

Black Tube	lb.	.11¼	@	.11½
Red Tube	lb.	.12	@	.12¼

Tires

Black (acid process)	lb.	.07½	@	.07¾
Black, selected tires	lb.	.06½	@	.06¾
Truck, Heavy Gravity	lb.	.08½	@	.08¾

Miscellaneous

Mechanical blends	lb.	.04½	@	.05½
White	lb.	.13	@	.13¼

Ducks

Enameling (single filling)	lb.	—	@ .43¼
Belting and Hose	lb.	—	@ .39
Single filling, A grade	lb.	—	@ .20½
Double filling, A grade	lb.	—	@ .20¾

CHEMICAL MARKETS

New York, June 13, 1942
All Prices F.O.B. Works

ACCELERATORS

Organic

A-1 (Thiocarbanilid)	lb.	.28 @	.33
A-10	lb.	.36 @	.42
A-11	lb.	.52 @	.65
A-19	lb.	.52 @	.65
A-32	lb.	.60 @	.70
A-77	lb.	.42 @	.55
A-100	lb.	.42 @	.55
Aldehyde ammonia, crystals	lb.	.65 @	.70
Altax	lb.	.45 @	.50
Beutene	lb.	.60 @	.65
B-J-F	lb.	.50 @	.55
Butyl Zimate	lb.	— @	1.13
Captax	lb.	.40 @	.47
Crylene	lb.	.40 @	.47
Di-Ortho-Tolyguanidine	lb.	.44 @	.46
Diphenylguanidine	lb.	.35 @	.45
El-Sixty	lb.	.40 @	.47
Ethyl Zimate	lb.	— @	1.13
Ethylidene aniline	lb.	.42 @	.43
Formaldehyde aniline	lb.	.31 @	—
Guantal	lb.	.40 @	.50
Hepteen	lb.	.35 @	.40
Hexamethylenetetramine	lb.	.33 @	—
Lead Oleate, No. 999	lb.	.13 @	—
Witco	lb.	.15 @	—
Methyl Tuads	lb.	— @	1.53
Methyl Zimate	lb.	— @	1.23
Monex	lb.	— @	1.55
Pentex	lb.	.75 @	.85
Phenex	lb.	.50 @	.55
Pip-Pip	lb.	— @	1.65
R & H 50-D	lb.	.42 @	.43
R-2	lb.	1.40 @	1.80
R-2 Crystals	lb.	1.55 @	1.70
Rotax	lb.	.50 @	.55
Safex	lb.	1.20 @	1.30
SPDX	lb.	.70 @	.75
Super-Sulphur No. 1	lb.	.50 @	—
No. 2	lb.	.13 @	.15
Thiocarbanilid, drums	lb.	.28 @	.33
Thiurad	lb.	— @	1.55
Trimene	lb.	.55 @	.65
base	lb.	1.05 @	1.20
Triphenylguanidine	lb.	.45 @	—
Ulto	lb.	1.25 @	1.75
Ureka	lb.	.50 @	.57
Blend B	lb.	.50 @	.57
Blend C	lb.	.48 @	.55
Vulcanex	lb.	.42 @	.43
Vulcanol	lb.	.85 @	—

Inorganic

Litharge, domestic	lb.	.07 @	.07½
Magnesia, calcined, heavy	lb.	.04 @	—

COLORS

Blacks (See Next Column)

Blues [b]

Prussian	lb.	.36 @	—
Ultramarine	lb.	.16 @	.27

Browns [b]

Mapico	lb.	.11 @	—
Umber, Turkey	lb.	.04¾ @	.05⅜

Greens [b]

Chrome	lb.	— @	.25
Guignet's Green	lb.	.70 @	—

Reds

Antimony			
crimson, 15/17	lb.	— @	—
sulfur, free	lb.	— @	—
Indian	lb.	.08¾ @	—
Domestic (Maroon)	lb.	.11 @	—
Mapico	lb.	.09¾ @	—
Red oxide, pure	lb.	.10 @	.12
Rub-Er-Red	lb.	.09¼ @	—

Whites [b]

Cryptone No. 19	lb.	.0560 @	.0585
Cryptone CB No. 21	lb.	.0560 @	.0585
Cryptone ZS-800	lb.	.0825 @	.0850
Lithopone:			
Albalith	lb.	.04¼ @	.04½
Astrolith	lb.	.04¼ @	.04½
Azolith	lb.	.04¼ @	.04½
Ray-cal	lb.	.05½ @	.05¾
Rayox	lb.	.14½ @	.15¼
Titanox A	lb.	.14½ @	.14¾
Titanox B	lb.	.05¾ @	.06
Titanox C	lb.	.05½ @	.05¾
Zinc Oxide—American Process [b]			
American Azo:			
ZZZ (lead free)	lb.	.07¼ @	.07½
Anaconda, lead free	lb.	.07¼ @	.07½
Horsehead Lead Free Brand:			
Special—3	lb.	.07¼ @	.07½
XX Red—4	lb.	.07¼ @	.07½
XX Red—72	lb.	.07¼ @	.07½
XX Red—103	lb.	.07¼ @	.07½
Kadox, black label—15	lb.	.07¼ @	.07½
Red label—17	lb.	.07¼ @	.07½
St. Joe, black label	lb.	.07¼ @	.07½
green label	lb.	.07¼ @	.07½
red label	lb.	.07¼ @	.07½
U. S. P.—7, bbls.	lb.	.10½ @	.10¾

[a] Price Ceilings.
[b] Price Suggestions or Agreements.

Zinc Oxide—French Process: [b]			
Florence White Seal—7 bbl.	lb.	.09½ @	.09¾
Green seal—8	lb.	.09 @	.09¼
Red seal—9	lb.	.08½ @	.08¾
Yellows [b]			
Cadmolith	lb.	.55 @	.60
Chrome	lb.	— @	.50
Mapico	lb.	.07¼ @	—

BLACKS

(In bags, carload lots)

Aerfloted Arrow	.0355 @	—
Certified	.0355 @	—
Certified Spheron	.0355 @	—
Continental	.0355 @	—
Disperso	.0355 @	—
Dixiedensed	.0355 @	—
Dixiedensed 66	.0355 @	—
Excello	.0355 @	—
Furnex	.03½ @	.06
Furnex Beads	.03½ @	.06
Gastex	.03½ @	.06
Kosmobile	.0355 @	—
Kosmobile 66	.0355 @	—
Kosmos-Dixie 20	.03½ @	.06
Micronex (Amarillo)	.0355 @	—
Micronex Beads (Amarillo)	.0355 @	—
Pelletex	.03½ @	.06
P-33	.0475 @	—
Shell Carbon (Del. Midwest)	.025 @	—
Supreme	.0355 @	—
Thermax	.0225 @	—
Wyex	.0355 @	—

COMPOUNDING MATERIALS

Aluminum Flake	ton	21.85	@24.50
Asbestine	ton	16.50	@20.00
Barium carbonate (98-100%)	ton	47.00	@49.00
Barytes	ton	25.35	@36.00
Bentonite	ton	11.00	@16.00
Blanc fixe, dry	ton	60.00	@67.50
Calcene	ton	37.50	@43.00
Catalpo (fact.)	lb.	.02	@ —
Chalk, precipitated			
Suprex white	ton	32.50	@45.00
Clay, Aerfloted, Suprex	ton	11.00	@23.50
Aerfloted Paragon	ton	10.00	@22.50
Crown (f.o.b. plant)	ton	11.00	@ —
Dixie	ton	11.00	@23.50
Langford	ton	—	@ 8.50
McNamee	ton	10.00	@22.50
Par	ton	—	@11.00
Witco	ton	10.00	@ —
Cotton Flock (Dark)	lb.	.10½	@ .13
Kalite No. 1	ton	26.00	@52.00
Kalite No. 3	ton	36.00	@62.00
Kalvan	ton	100.00	@126.00
Magnesium carbonate	lb.	.06¼	@ —
Mica	ton	35.00	@44.00
Mineralite	ton	—	@30.00
Pyrax A	ton	7.50	@20.00
Rottenstone (powd. Dom.)	ton	25.50	@37.50
Rubberol	lb.	—	@ .17½
Silene (calcium silicate)	lb.	.04	@ .045
Starch, powdered	cwt.	2.90	@ 4.10
Talc, domestic	ton	17.00	@25.00
Whiting, commercial	ton	16.00	@26.00
Columbia Filler	ton	9.00	@14.00
Witco	ton	6.00	@ —
Wood Flour (100 mesh)	ton	30.00	@32.00

MINERAL RUBBER

285°-300° Mineral Rubber	ton	25.00	@ —
Black Diamond	ton	25.00	@ —
Genasco, solid (factory)	ton	—	@ —
Hard Hydrocarbon	ton	25.00	@42.00
Parmr, solid	ton	—	@ —
Pioneer, MR, solid	ton	—	@ —

MISCELLANEOUS

Aromatics—Rodo #0	lb.	4.00 @	4.50
Rodo #10	lb.	5.00 @	5.50
Curodex 19	lb.	2.75 @	—
Curodex 188	lb.	3.50 @	—
Curodex 198	lb.	4.50 @	—
Para-Dors	lb.	4.50 @	—
Aresklene No. 375 (dispersing, wetting and penetrating agent)	lb.	.35 @	.50
Darvan (dispersing agent)	lb.	.30 @	.39
Santomerse S (dispersing, wetting, penetrating and stabilizing agent)	lb.	.11 @	.25
Sponge Paste	lb.	— @	.18
Sunproof	lb.	.23 @	.28
Tackol (tackifier)	lb.	.085 @	.18
Tonox	lb.	.52 @	.61
Ty-Ply R (and S)	gal.	6.75 @	8.75
Unicel (blowing agent)	lb.	.50 @	—

SOFTENERS

Acids			
Acetic, 28%, bbls. [a]	100 lb.	3.38 @	3.63
Nitric, 36 degrees	cwt.	5.00 @	—
Acids, Fatty			
Laurex	lb.	.15 @	.17½
SL #10	lb.	.12 @	.14
Stearex Beads	lb.	.10 @	.11
Stearic, double pressed	lb.	.12½ @	.13½
Stearite	lb.	.10 @	—

Alkalies			
Caustic Soda, 76%	cwt.	2.70 @	5.70
Soda Ash, 58%	cwt.	1.15 @	2.98
Oils			
Cycline Oil	gal.	.14 @	.20
Degras, bbls.	lb.	.12 @	.12½
Para-Flux	gal.	.17 @	.18
Para-Lube	lb.	.046 @	.048
Petrolatum, amber [b]	lb.	.03½ @	.04½
Pigmentaroil, tank cars	gal.	.20½ @	—
in drums	gal.	.29 @	.30
Pine, steam distilled	gal.	1.20 @	—
Rosin Oil, cmpd.	gal.	.40 @	—
Rubberol	lb.	.13½ @	.14
Rubtack	lb.	.10 @	—
Seedine, c.l.	lb.	.07¼ @	—
Tackol	lb.	.08½ @	.18
Witco Palm Oil	lb.	— @	—
Witco Softener No. 20	gal.	.20 @	—
Woburn No. 8, c.l.	lb.	.06 @	—
Resins and Pitches			
Pitch, Burgundy	lb.	.06 @	.06½
coal tar	ton	19.00 @	22.00
hardwood	ton	16.00 @	22.50
pine, 200 lb. gr. wt.	bbl.	6.00 @	6.50
Pigmentar, tank cars	gal.	.20½ @	—
in drums	gal.	.29 @	.30
Retort Pine Tar, drums	gal.	.29 @	.30
Solvents			
Acetone, pure [a]	lb.	.07 @	.173
Benzene, 90%, tank car	gal.	.14 @	—
Beta-Trichlorethane	gal.	— @	.20
Bondogen	lb.	.98 @	1.25
Carbon, bisulfide	lb.	.05 @	.08½
Carbon tetrachloride	gal.	.73 @	1.27
Dichlorethylene	lb.	— @	—
Dipentene, cml., drums	gal.	.48 @	.50
Ethylene dichloride	lb.	.07½ @	.08½
Plastogen	lb.	.07¾ @	.12
Reogen (drums)	lb.	.11½ @	.15
Rub-Sol	gal.	.09½ @	—
Trichlorethylene	lb.	.08 @	.09½
Turpentine, spirits	gal.	.82 @	.86
dest. dist., drums	gal.	.60 @	.65
Waxes			
Beeswax, white [b]	lb.	.61 @	—
Carnauba, yellow [b]	lb.	.86 @	.88
Ceresin, white, dom.	lb.	.13½ @	.15
Montan, crude	lb.	.45 @	.46
Paraffin [a]			
Yellow crude scale, 124/126	lb.	.04¼ @	—
Refined, 125/125	lb.	.05¼ @	—

ANTI-OXIDANTS

Agerite Alba	lb.	1.95 @	2.05
Gel	lb.	.56 @	.58
Hipar	lb.	.64 @	.66
Powder	lb.	.48 @	.50
Resin	lb.	.48 @	.50
Resin D	lb.	.48 @	.50
White	lb.	1.23 @	1.33
Albasan	lb.	.70 @	.75
Antox	lb.	— @	.56
B-L-E	lb.	.52 @	.61
Flectol H	lb.	.52 @	.65
Flectol White	lb.	.90 @	1.15
Neozone A, B, C, D, E	lb.	.52 @	.63
Oxynone	lb.	.77 @	.90
Retardex	lb.	.45 @	.48
Santoflex B	lb.	.52 @	.65
Santovar A	lb.	1.15 @	1.40
S.C.R.	lb.	.33 @	.35
Stabilite	lb.	.52 @	.54
Stabilite Alba	lb.	.70 @	.75
VGB	lb.	.52 @	.61

EXTENDERS

Naftolen	lb.	.15 @	.25
Vanzak	gal.	.05 @	.06

LUBRICANTS—MOLD & RUBBER SURFACE

Aresklene	lb.	.35 @	.50
Cocoa Soapstock	lb.	.06 @	.08
Colite	gal.	.90 @	1.15
Dipex	lb.	.06 @	.08
Glycerized Liquid Lubricant	gal.	— @	1.35
Lubrex	lb.	.25 @	.30
Mineralite	ton	— @	30.00
Mold Paste	lb.	.12 @	.18
Sericite	ton	65.00 @	75.00
Soap Tree Bark, cut, sifted	lb.	.06 @	.08

FACTICE OR RUBBER SUBSTITUTES

Amberex	lb.	.25 @	—
Amberex Type B	lb.	.18¾ @	—
Black	lb.	.08½ @	.13
White	lb.	.09 @	.15
Brown	lb.	.10 @	.14
Neophax A	lb.	.16½ @	—

VULCANIZING INGREDIENTS

Dispersed Sulfur No. 2	lb.	.08 @	.12
Sulfur Chloride, yellow (drs.)	lb.	.03 @	.08
Sulfur, rubber makers			
Refined (bags)	cwt.	2.40 @	—
Commercial (bags)	cwt.	2.05 @	—
Telloy	lb.	1.75 @	—
Vandex	lb.	1.75 @	—

STATISTICS

SPECIAL NOTE: Much of the statistics carried in this section is of military value and accordingly have been discontinued for the duration of the war. See explanatory footnotes under each table.

U. S. Imports and Exports of Crude Rubber

YEARS	Gross Imports: Long Tons	Gross Imports: Total Declared Value	Gross Imports: Average Declared Value per pound Cents	Re-exports: Long Tons	Re-exports: Total Declared Value	Re-exports: Average Declared Value per pound Cents	Net Imports: Long Tons
1924	325,899	173,367,272	23.75	10,309	6,057,637	26.23	315,590
1925	393,370	426,167,504	48.36	14,827	19,847,753	59.76	378,543
1926	409,944	501,131,064	54.57	17,671	22,470,583	56.77	392,273
1927	424,733	338,688,492	35.60	27,775	24,735,488	39.76	396,958
1928	432,633	242,727,423	25.05	32,159	18,128,761	25.17	400,474
1929	560,082	239,177,811	19.06	36,485	16,868,718	20.64	523,597
1930	482,083	139,133,048	12.88	30,205	9,310,205	13.76	451,878
1931	497,176	72,922,845	6.55	25,595	4,255,572	7.42	471,581
1932	409,556	31,936,459	3.48	20,930	2,015,612	4.30	388,626
1933	407,817	44,034,064	4.82	20,537	2,601,352	5.65	387,280
1934	449,513	97,929,676	9.73	23,848	5,770,109	10.80	425,665
1935	453,134	115,299,448	11.36	11,389	3,084,331	12.09	441,745
1936	467,064	152,072,496	14.54	12,581	4,488,223	15.93	454,483
1937	574,600	237,307,041	18.44	7,902	3,385,433	19.02	566,698
1938	397,620	125,357,730	14.07	5,652	1,799,124	14.21	391,968
1939	469,803	167,558,245	15.92	13,125	5,832,618	19.84	456,678
1940	780,820	303,117,726	17.33	7,060	3,197,136	20.22	773,760
1941*	739,678	301,224,726	18.18	4,177	2,116,945	22.63	735,501
1940:							
Sept.	75,770	29,317,540	17.27	666	349,443	23.43	75,104
Oct.	73,179	27,975,598	17.07	316	123,216	17.38	72,863
Nov.	69,844	26,917,136	17.21	126	52,020	18.45	69,718
Dec.	94,172	36,369,973	17.24	205	94,422	20.52	93,967
1941:							
Jan.	84,201	33,370,482	17.69	292	138,009	21.11	83,909
Feb.	70,745	28,469,753	17.97	327	144,139	19.69	70,418
Mar.	84,991	34,030,846	17.88	329	163,375	22.19	84,662
Apr.	61,288	24,193,639	17.62	238	99,371	18.96	61,054
May	98,438	39,537,574	17.93	370	204,865	24.72	98,068
June	62,124	25,179,498	18.09	476	257,254	24.13	61,648
July	94,622	39,296,581	18.54	423	219,597	23.17	94,199
Aug.	104,057	44,101,058	18.92	973	488,299	22.40	103,084
Sept.	79,212	33,045,295	18.62	749	402,036	23.96	78,463

Note: Statistics supplied by the Department of Commerce. Publication of figures discontinued with those of September, 1941, for the duration of the war. Gross Imports shown do not include latex or guayule. (*) First 9 months only.

United States Imports of Guayule, Balata, Jelutong, Liquid Latex

(All Quantities in Long Tons)

	Guayule Tons	Guayule Dollars	Balata Tons	Balata Dollars	Jelutong Tons	Jelutong Dollars	Liquid Latex Tons	Liquid Latex Dollars
1924	1,356	536,392	464	568,456	6,165	1,237,100	2,157	864,059
1925	3,781	1,803,448	517	574,750	6,749	1,642,531	3,272	3,537,510
1926	4,305	2,562,096	354	327,213	7,263	3,127,757	3,394	4,686,743
1927	5,018	2,674,957	582	477,246	7,785	2,448,657	1,495	1,170,650
1928	3,077	1,755,685	731	430,855	7,552	2,540,059	4,007	2,121,786
1929	1,275	545,175	728	566,964	8,204	2,458,126	3,729	1,788,391
1930	1,096	347,388	502	422,684	5,907	1,403,244	4,458	1,508,786
1931	....	.....	1,207	411,380	5,777	1,019,010	4,675	888,909
1932	....	.....	707	147,403	4,607	616,596	5,112	601,999
1933	...	.....	1,659	2,261,869	5,990	944,895	11,085	1,833,671
1934	398	75,349	1,054	438,209	4,987	943,752	13,107	3,643,221
1935	459	86,835	615	188,384	5,644	1,063,126	13,553	3,782,222
1936	1,229	286,552	535	199,368	6,163	1,296,364	19,852	6,659,899
1937	2,694	745,873	354	151,344	7,109	2,017,786	23,185	10,213,670
1938	2,485	623,819	509	181,140	9,132	2,944,504	11,878	4,147,318
1939	2,232	463,345	694	265,553	6,640	1,603,418	27,438	10,467,552
1940	3,634	758,007	648	300,500	7,451	2,449,137	33,789	14,593,466
1941*	3,536	812,966	581	257,326	5,495	1,789,227	20,775	9,280,551
1940:								
Sept.	250	49,845	40	19,245	712	246,641	2,953	1,337,487
Oct.	381	77,286	70	38,092	1,150	382,168	1,156	512,153
Nov.	392	78,587	67	43,939	445	152,297	2,308	1,169,086
Dec.	278	62,586	54	39,471	1,102	341,876	3,534	1,539,957
1941:								
Jan.	447	104,128	57	32,910	698	221,911	2,184	1,019,741
Feb.	283	65,942	41	22,790	768	245,732	2,946	1,279,648
Mar.	426	98,187	36	16,147	715	258,314	1,707	774,225
Apr.	423	95,916	64	18,533	514	189,520	1,594	648,217
May	334	76,414	61	44,381	822	287,249	2,632	1,117,226
June	383	86,949	67	30,470	552	179,779	2,070	936,944
July	411	94,874	100	34,119	830	215,176	2,049	930,126
Aug.	499	111,502	41	19,344	159	50,934	1,984	779,079
Sept.	330	79,054	114	38,632	437	140,412	3,609	1,795,345

Note: Statistics supplied by the Department of Commerce. Publication of figures discontinued with those of September, 1941, for the duration of the war. Figures shown for latex are dry rubber content. (*) First 9 months only.

U. S. Consumption of Crude Rubber

(Including Latex)

Figures on Monthly Basis

	1934	1935	1936	1937	1938	1939	1940	1941
Jan.	39,190	46,636	48,631	50,879	31,265	47,387	58,061	65,989
Feb.	40,515	42,720	36,841	51,950	25,357	43,422	52,078	62,692
Mar.	47,003	42,153	42,813	54,129	32,389	51,416	52,454	69,024
Apr.	44,853	44,247	52,031	51,859	29,730	45,268	52,361	71,374
May	42,918	41,101	50,612	51,795	30,753	45,484	54,513	71,365
June	40,147	36,156	52,772	51,860	32,540	48,438	47,834	84,912
July	32,553	35,917	48,250	43,703	34,219	44,975	48,354	68,653
Aug.	33,216	38,775	46,777	41,506	40,552	51,740	53,307	55,365
Sept.	30,258	37,086	46,449	43,945	40,183	51,402	52,469	53,655
Oct.	31,253	41,969	49,637	38,754	42,850	57,155	59,644	60,418
Nov.	34,748	42,310	50,433	34,025	49,050	55,677	57,716	N.A.
Dec.	36,569	42,474	49,754	29,195	48,143	49,636	59,709	N.A.
Tot.	453,223	491,544	575,000	543,600	437,031	592,000	648,500	663,447*

Note: Figures for 1934 to 1940, inclusive, are based on the annual surveys conducted by the former Leather & Rubber Division of the Bureau of Foreign & Domestic Commerce; figures for 1941 are estimates of the Rubber Manufacturers Association. Publication of figures was discontinued with those of October, 1941, for the duration of the war. (N.A.) Not Available. (*) First 10 months only.

Reclaimed Rubber in the United States

(All Quantities in Long Tons)

Year	Production	Consumption Tons	Consumption % to Crude	Stocks	Year	Production	Consumption Tons	Consumption % to Crude	Stocks
1932	75,656	77,500	23.3	16,334	1937	185,033	162,000	29.8	28,800
1933	93,587	85,000	21.2	17,780	1938	122,400	120,800	29.9	23,000
1934	108,162	100,855	22.3	20,000	1939	186,000	170,000	28.7	25,250
1935	122,948	117,523	23.9	17,000	1940	208,971	190,244	29.3	32,636
1936	150,571	141,486	24.6	19,000	1941*	228,524	212,940	32.1	38,604†

Figures on Monthly Basis

1940:									
Jan.	19,239	16,341	28.1	27,089	July	14,299	14,539	30.1	27,129
Feb.	17,938	15,629	30.0	27,962	Aug.	17,161	14,464	27.1	28,526
Mar.	17,182	16,200	30.9	27,524	Sept.	16,379	14,835	28.3	29,039
Apr.	16,518	16,573	31.7	26,492	Oct.	19,300	16,807	28.2	30,816
May	17,499	15,984	29.3	27,141	Nov.	17,636	16,312	28.3	31,459
June	16,581	15,163	31.7	27,701	Dec.	19,239	17,397	29.1	32,636
1941:									
Jan.	20,413	19,086	28.9	33,380	July	23,111	21,725	31.6	36,751
Feb.	19,506	18,222	29.1	33,654	Aug.	24,111	20,864	38.7	39,099
Mar.	22,006	19,611	28.4	35,028	Sept.	24,678	24,032	44.8	38,055
Apr.	21,574	20,427	28.6	35,336	Oct.	26,560	25,009	41.4	38,604
May	22,775	21,405	30.0	35,871	Nov.	N.A.	N.A.	...	N.A.
June	23,790	22,559	26.6	36,265	Dec.	N.A.	N.A.	...	N.A.

Note: Figures for 1932 to 1940, inclusive, are based on the annual surveys conducted by the former Leather & Rubber Division of the Bureau of Foreign & Domestic Commerce; figures for 1941 are estimates of the Rubber Manufacturers Association. Publication of figures was discontinued with those of October, 1941, for the duration of the war. (N.A.) Not Available. (*) First 10 monthly only. (†) As of October 31, 1941.

U. S. Consumption of Gasoline

(In Thousands of Barrels of 42 Gallons)

	1939	1940	1941		1939	1940	1941
January	38,089	40,370	45,344	August	54,025	55,346	62,944
February	34,928	37,557	42,001	September	49,505	52,297	58,995
March	43,042	44,607	48,760	October	49,854	53,807	N.A.
April	44,264	47,683	55,154	November	47,407	49,074	N.A.
May	49,766	52,946	59,307	December	43,807	46,413	N.A.
June	50,133	55,459	58,360				
July	50,689	53,865	63,093	Total	555,509	589,424	493,958*

Note: Statistics supplied by the Bureau of Mines. Publication of figures was discontinued with those of September 1941, for the duration of the war. (*) First 9 months only. (N.A.) Not Available.

Rims Inspected and Passed in U. S.

(Tire and Rim Association Reports)

	Total		Total		Total
1930	17,364,096	1934	12,255,118	1938	10,619,338
1931	11,253,800	1935	18,664,107	1939	17,471,914
1932	6,261,336	1936	20,789,504	1940	19,378,558
1933	8,713,962	1937	22,257,798	1941	25,193,698

1942		1942		1942	
January ...	1,270,636	May	617,054	September .	.....
February ..	823,357	June	.....	October ...	.....
March	668,536	July	.....	November .	.....
April	664,875	August	.....	December ..	.....

Daily Spot Closing Prices of Ribbed Smoked Sheet Rubber—*New York Market, in Cents per Pound*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Av.
1939																																
December	20	20	—	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	—	20⅛	20⅛	20⅛	20⅛	20⅛	20⅛	—	20⅛	20⅛	20⅛	20⅛	20⅛	—	—	—	20⅛	19⅜	19⅜	19⅜	19⅜	—	20
1940																																
January	19⅜	19⅜	19⅜	19⅜	19⅛	19⅛	—	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅛	19⅛	19⅜	19⅜	19⅜	19⅜	—	19⅛	18⅞	18⅞	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	19
February	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	18⅜	18⅜
March	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅛	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	19⅛	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜
April	18⅛	18⅛	18⅛	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜	18⅜
May	19⅛	19⅛	20	20⅛	21⅛	20	21⅛	20⅛	19⅜	18⅞	18⅞	18⅜	18⅜	19	19⅜	19⅜	19⅜	19⅜	20	20	20	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜
June	22	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	22⅛	22⅛	23⅛	23⅛	23⅛	24	23⅛	23⅛	22⅝	22⅝	22⅝	23	23	20	20	20	20⅝	20⅝	20⅝	20⅝	20⅝	21	—	21⅛
July	21⅜	21⅜	20⅜	—	—	—	—	—	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	23	22⅛
August	19⅜	19⅜	—	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	20	—	19⅜
September	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
October	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜
November	20⅛	20⅛	20⅛	20⅛	20⅛	20⅛	20⅛	20⅛	21⅛	21⅛	21⅛	21⅛	21⅛	21⅛	21⅛	21⅛	20⅜	20⅜	21⅛	21	21	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜
December	—	—	20⅜	20⅜	20⅜	20⅜	21	—	21	21	21	21	21	21	—	—	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	20⅜	21
1941																																
January	20⅛	—	20⅛	20⅛	20⅛	20⅛	20⅛	20⅛	20⅛	20⅛	—	—	20⅛	20⅛	19⅛	19⅛	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜
February	—	—	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	20⅛	20⅛	20⅛	20⅛	20⅛	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜	19⅜
March	22⅛	22⅛	20⅜	21⅛	21⅛	21⅛	21⅛	21⅛	21⅛	21⅛	22	22	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛
April	23⅜	23⅜	24⅜	23⅜	23⅜	24⅜	24	24	24⅜	24⅜	24⅜	24⅜	24⅜	24⅜	24⅜	24⅜	24⅜	24⅜	24⅜	24⅜	24⅜	24⅜	24⅜	24⅜	24⅜	24⅜	24⅜	24⅜	24⅜	24⅜	24⅜	23⅞
May	24	24	23⅜	22⅜	22⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜
June	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜	21⅜
July	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
August	22⅝	22⅝	22⅝	22⅝	23	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝
September	22⅝	22⅝	22⅝	23	23	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝	22⅝
October	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛	22⅛
November	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜
December	23⅜	23⅜	23⅜	23⅜	23⅜	23⅜	—	23⅜	24	24	24	24	23⅜	—	24⅜	24⅜	24⅜	24⅜	24⅜	—	—	—	24½	24½	—	23⅜	23½	23½	23½	24¼	24¼	23⅞
1942																																
January	—	24¼	—	—	24½	24⅜	24⅜	24⅜	24⅜	—	—	24⅜	24⅜	24⅜	24⅜	24⅜	—	—	24⅜	24	23⅜	24	24	—	—	23¾	23	23½	23½	23¾	—	24

Note: In view of government regulations concerning the purchase of crude rubber trading in so-called "free" rubber practically stopped by the end of January, 1942, which accounts for the lack of quotations after January 31, 1942.

Average Spot Closing Prices—Ribbed Smoked Sheets

(New York Markets)

Average Price per Pound for Years 1913-1932

Year	Cents	Year	Cents	Year	Cents	Year	Cents	Year	Cents
1914	65.33	1918	60.15	1922	17.50	1926	48.50	1930	11.98
1915	65.85	1919	48.70	1923	29.45	1927	37.72	1931	6.17
1916	72.50	1920	36.30	1924	26.20	1928	22.48	1932	3.49
1917	72.23	1921	16.36	1925	72.46	1929	20.59	1933	5.96

Average Monthly Price per Pound Since 1933

	1934 Cents	1935 Cents	1936 Cents	1937 Cents	1938 Cents	1939 Cents	1940 Cents	1941 Cents
Jan.	9.32	13.10	14.35	21.37	14.63	15.75	19.06	19.88
Feb.	10.45	12.92	15.48	21.33	14.71	15.93	18.83	20.43
Mar.	11.01	11.51	15.89	24.09	13.55	16.26	18.58	22.17
Apr.	12.10	11.55	15.98	23.44	11.84	15.87	19.16	22.74
May	13.26	12.05	15.62	21.14	11.57	16.07	21.21	23.90
June	13.51	12.57	15.85	19.29	12.57	16.37	22.20	21.88
July	14.60	12.10	16.49	18.86	15.37	16.51	21.12	22.19
Aug.	15.47	11.98	16.25	18.37	16.08	16.67	19.62	22.70
Sept.	15.36	11.55	16.46	18.55	16.15	21.24	19.28	22.57
Oct.	13.96	12.62	16.55	16.28	16.89	19.89	20.33	23.10
Nov.	13.04	13.15	17.97	14.60	16.24	20.21	21.04	23.14
Dec.	12.98	13.28	20.01	15.41	16.05	20.01	20.76	24.04
Average for Year	12.92	12.37	16.41	19.39	14.64	17.57	20.10	22.40

London Closing Prices of Ribbed Smoked Sheets

(In Pence Per Pound)

Day	1941 May	1941 June	1941 July	1941 Aug.	Day	1941 May	1941 June	1941 July	1941 Aug.
1	14	—	—	—	16	14 7/16	—	—	—
2	14	—	—	—	17	—	—	—	—
3	—	13 7/16	—	—	18	—	—	—	—
4	—	13 15/32	—	—	19	14	—	—	—
5	—	13 29/32	—	—	20	13 31/32	—	—	—
6	—	13 29/32	—	—	21	13 7/8	—	—	—
7	—	—	—	—	22	13 7/8	—	—	—
8	—	—	—	—	23	13½	—	—	—
9	—	—	—	—	24	—	—	—	—
10	—	—	—	—	25	—	—	—	—
11	—	—	—	—	26	13 1/16	—	—	—
12	—	—	—	—	27	13 1/8	—	—	—
13	—	—	—	—	28	13 3/16	—	—	—
14	—	—	—	—	29	13 3/16	—	—	—
15	14	—	—	—	30	13 3/8	—	—	—
					31	—	—	—	—

Note: No quotations have been made on the London Exchange since June 6.

Average Monthly Price Per Pound

Month	1938 Pence	1939 Pence	1940 Pence	1941 Pence	Month	1938 Pence	1939 Pence	1940 Pence	1941 Pence
Jan.	7.077	7.926	11.793	12.415	Aug.	7.841	8.545	12.818	
Feb.	7.029	7.942	12.577	12.769	Sept.	7.918	9.634	11.964	
Mar.	6.590	8.120	11.651	13.967	Oct.	8.355	10.177	11.813	
Apr.	5.793	7.910	10.980	14.228	Nov.	8.111	11.210	11.801	
May	5.632	8.002	11.600	13.670	Dec.	8.005	11.559	11.963	
June	6.147	8.216	13.046	—	Average for Year.	7.164	8.959	12.035	
July	7.464	8.271	12.410	—					

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market)

Recent Daily Price Per Pound

Date	1942 Apr.	1942 May	1942 June	Date	1942 Apr.	1942 May	1942 June	Date	1942 Apr.	1942 May	1942 June
1	21.14	20.95	20.35	11	21.16	21.07	19.41	22	21.04	20.72	
2	21.23	20.92	20.07	12	—	21.00	19.42	23	20.99	20.73	
3	—	—	19.95	13	21.14	21.01	19.60	24	20.97	—	
4	21.23	20.94	20.10	14	21.03	21.02		25	20.91	20.52	
5	—	21.00	19.93	15	21.05	21.14		26	—	20.63	
6	21.33	20.96	19.44	16	21.20	21.04		27	20.82	20.69	
7	21.22	21.09	—	17	21.20	—		28	20.65	20.61	
8	21.32	21.15	19.13	18	21.13	20.88		29	20.91	20.55	
9	21.39	21.14	19.56	19	—	20.89		30	20.90	—	
10	21.34	—	19.66	20	21.08	20.83		31	—	—	
				21	21.02	20.62					

Average Monthly Price Per Pound

	1939 Cents	1940 Cents	1941 Cents	1942 Cents		1939 Cents	1940 Cents	1941 Cents	1942 Cents
Jan.	8.94	11.19	10.66	19.85	Aug.	9.30	9.84	17.06	
Feb.	8.97	11.10	10.87	20.07	Sept.	9.30	9.69	17.94	
Mar.	9.00	10.90	11.08	20.42	Oct.	9.24	9.62	17.31	
Apr.	8.87	10.89	11.48		Nov.	9.73	9.97	17.21	
May	9.56	10.33	12.97		Dec.	1097	10.18	18.09	
June	9.88	10.72	14.66		Average for Year	9.46	10.40	14.66	
July	9.71	10.42	16.55						

Stocks of Crude Rubber

(All figures are in long tons)

ON HAND OR AFLOAT TO THE U. S.

End of	ON HAND 1939	1940	1941	AFLOAT 1939	1940	1941	TOTAL 1939	1940	1941
Jan.	220,727	139,304	309,411	48,210	90,285	153,169	268,937	229,589	462,580
Feb.	207,882	129,023	320,372	55,814	112,257	136,955	263,696	241,280	457,327
Mar.	201,752	134,871	338,147	55,981	113,619	140,228	257,733	248,490	478,375
Apr.	188,074	152,645	329,767	57,918	102,557	153,484	245,992	255,202	483,251
May	187,980	148,881	359,234	54,046	109,364	147,459	242,026	258,245	506,693
June	173,493	154,313	339,108	51,274	119,138	175,499	224,767	273,451	514,607
July	165,450	175,455	395,216	52,990	139,629	132,304	218,440	315,084	527,520
Aug.	152,029	194,760	446,008	66,717	141,286	90,591	218,746	336,046	536,599
Sept.	136,824	220,597	473,684	68,310	137,888	141,756	205,134	358,485	615,440
Oct.	119,404	235,353	454,711	100,500	166,837	172,633	219,904	402,190	627,344
Nov.	105,205	250,412		114,044	158,095		219,249	408,507	
Dec.	125,800	288,864		91,095	145,950		216,895	434,814	

Note: Above figures include stocks held by United States Government.

STOCKS OUTSIDE REGULATED AREAS

(Figures from the International Rubber Regulation Committee)

1940	Singapore and Penang	Para and Manaos	United Kingdom	United States	Total
November	33,778	3,697	30,000*	276,943	344,418
December	26,773	2,165	35,000*	318,486	382,424
1941					
January	37,145	2,151	40,000*	309,411	388,707
February	46,888	2,510	40,000*	320,372	409,795
March	41,005	1,200	40,000*	338,147	420,352
April	42,065	2,205	40,000*	329,767	414,057
May	44,593	1,768	40,000*	364,107	450,485
June	43,263	915	40,000*	339,108	423,286
July	41,534	1,063	40,000*	395,216	477,813
August	44,920	1,145	40,000*	446,008	532,073
September	32,997	1,772	40,000*	473,684	548,453
October	48,399	2,048	40,000*	454,711	545,158

* Estimated.

STOCKS INSIDE REGULATED AREAS

(Figures from the International Rubber Regulation Committee)

1940	Malaya	N.E.I.[1]	Ceylon [1]	Other *	Total
November	43,693	39,267	11,675	3,997	98,632
December	48,787	48,622	11,850	4,124	113,383
1941					
January	47,198	45,137	13,196	4,329	109,860
February	55,512	48,795	14,677	4,064	123,048
March	44,522	48,534	13,841	4,210	111,107
April	53,237	46,787	14,432	4,009	118,465
May	46,511	49,184	14,444	3,772	113,911
June	46,758	51,354	11,908	4,432	114,452
July	49,666	56,352	13,595	4,113	123,726
August	46,558	55,601	12,444	4,003	118,606
September	46,299	48,667	13,052	2,140	110,158
October	50,325	.....	14,366	3,961	.....

(1) Estates and Dealers. (*) Estimated.

RUBBER STOCKS AFLOAT

End of: 1940	Afloat for United States	Afloat for Europe	All Other Afloat	Total Afloat
August	141,286	55,000	53,714	255,000
September	137,033	60,000	67,967	265,000
October	166,837	60,000	38,163	265,000
November	158,095	60,000	31,905	250,000
December	145,950	60,000	44,050	250,000
End of: 1941				
January	153,169	60,000	51,831	265,000
February	136,955	60,000	48,045	245,000
March	140,228	60,000	59,772	260,000
April	153,484	60,000	61,516	275,000
May	147,459	60,000	47,541	255,000
June	175,499	60,000	39,501	275,000
July	132,304	60,000	47,696	240,000
August	90,591	60,000	.....	.....

Note: *Total Afloat* figures are estimated at 1½ months' world shipments by the International Rubber Regulation Committee. *Afloat for U. S.* is supplied by the Rubber Manufacturers Association. *Afloat for Europe* is estimated. *All Other Afloat* is determined by subtraction.

TOTAL WORLD STOCKS

At End of:	1936	1937	1938	1939	1940	1941
January	600,479	454,249	549,762	497,665	433,841	753,021
February	599,355	445,265	565,833	479,578	429,551	769,193
March	583,318	447,856	586,666	460,723	447,472	783,737
April	567,172	428,249	586,291	438,252	465,345	765,521
May	541,871	413,134	568,158	429,979	470,981	777,429
June	520,255	434,250	573,136	407,640	500,774	771,241
July	519,074	445,782	580,654	418,639	547,708	780,324
August	500,520	457,462	565,394	397,345	579,119	839,019
September	493,585	470,768	551,447	396,867	631,888	874,917
October	486,159	479,398	540,976	413,274	651,775	905,138
November	466,491	493,266	512,196	395,217	659,308	.....
December	466,576	545,533	482,852	391,125	702,089	.....
Monthly Avge.	528,738	460,022	555,280	427,192	543,321	.....

Note: Figures prior to 1941 represent principal world stocks only, as supplied by the Department of Commerce. Figures since 1941 represent total world stocks, as compiled by the Commodity Exchange, Inc.

U. S. Tire and Tube Statistics

(All Figures Represent Thousands)

AUTOMOBILE CASINGS

Production Figures on Quarterly Basis

Quarter	1934	1935	1936	1937	1938	1939	1940	1941
Jan.-Mar.	13,437	13,355	11,376	15,565	7,314	13,946	14,896	16,334
Apr.-June	13,565	12,597	14,892	15,834	7,380	13,759	15,636	18,308
July-Sept.	9,822	11,312	14,914	12,207	10,794	15,182	13,877	15,123
Oct.-Dec.	10,406	12,099	14,858	9,704	12,360	14,726	14,777	11,768
Total	47,230	49,363	56,040	53,310	37,848	57,613	59,186	61,533

Shipment Figures on Quarterly Basis

Quarter	1934	1935	1936	1937	1938	1939	1940	1941
Jan.-Mar.	10,730	11,154	10,554	14,143	7,388	12,445	12,791	15,264
Apr.-June	14,998	13,473	15,940	15,741	9,564	15,107	17,595	21,276
July-Sept.	11,648	13,489	14,037	13,106	11,243	15,791	12,904	18,104
Oct.-Dec.	9,310	12,066	12,855	10,495	12,098	14,165	15,484	12,519
Total	46,686	50,182	53,386	53,485	40,293	57,508	58,774	66,163

Inventory Figures [2]

Quarter	1934	1935	1936	1937	1938	1939	1940	1941
Jan.-Mar.	11,651	11,675	8,762	12,004	10,547	9,963	10,789	10,149
Apr.-June	10,219	10,755	7,556	12,081	8,337	8,632	8,871	7,088
July-Sept.	8,419	8,288	8,690	11,200	7,859	8,080	9,837	5,154
Oct.-Dec.	9,455	8,196	10,717	10,383	8,166	8,665	9,127	4,417

Figures for Recent Months

	PRODUCTION 1940	1941	1942	SHIPMENTS 1940	1941	1942	INVENTORY [2] 1940	1941	1942
Jan.	4,955	5,487	1,369	4,274	4,850	1,231	9,352	9,797	4,550
Feb.	4,916	5,162	1,113	4,144	4,896	1,116	10,137	10,029	4,553
Mar.	5,025	5,686	1,156	4,373	5,518	1,027	10,789	10,149	4,809

AUTOMOBILE INNER TUBES

Production Figures on Quarterly Basis

Quarter	1934	1935	1936	1937	1938	1939	1940	1941
Jan.-Mar.	12,823	12,553	11,891	15,831	7,314	12,383	12,801	15,349
Apr.-June	13,191	11,631	14,624	15,413	7,380	11,847	13,703	17,584
July-Sept.	10,321	11,270	15,320	12,038	10,794	13,118	12,425	13,858
Oct.-Dec.	9,891	12,425	15,201	9,092	12,360	13,300	13,308	10,591
Total	46,226	47,879	57,036	52,374	37,848	50,648	52,237	57,382

Shipment Figures on Quarterly Basis

Quarter	1934	1935	1936	1937	1938	1939	1940	1941
Jan.-Mar.	10,640	11,252	11,367	14,606	7,387	11,422	11,683	14,264
Apr.-June	14,553	11,928	15,113	15,495	9,564	13,010	14,978	18,576
July-Sept.	11,545	13,251	15,069	12,901	11,243	13,449	11,344	15,490
Oct.-Dec.	8,306	11,636	12,874	9,765	12,099	13,309	14,209	11,359
Total	45,044	48,067	54,423	52,767	40,293	51,190	52,214	59,689

Inventory Figures [2]

Quarter	1934	1935	1936	1937	1938	1939	1940	1941
Jan.-Mar.	10,244	10,406	8,660	11,993	10,547	8,752	8,110	8,069
Apr.-June	8,795	10,050	8,075	11,833	8,337	7,549	6,848	7,010
July-Sept.	7,639	7,565	8,595	11,326	7,859	7,206	7,970	5,431
Oct.-Dec.	9,180	8,231	10,945	10,312	8,166	7,306	7,017	4,678

Figures for Recent Months

	PRODUCTION 1940	1941	1942	SHIPMENTS 1940	1941	1942	INVENTORY [2] 1940	1941	1942
Jan.	4,199	5,112	1,328	3,761	4,473	1,257	7,417	7,633	4,712
Feb.	4,207	4,887	1,051	3,805	4,610	1,099	7,828	7,924	4,678
Mar.	4,395	5,349	1,129	4,117	5,182	986	8,110	8,069	5,026

[1] These figures are based on reports received from the Rubber Manufacturers Association. They are revised frequently and the latest available issue should be consulted for most reliable figures.

[2] Stocks held by manufacturers at end of period indicated.

Automobile Production

Year	United States Total	Passenger Cars	Trucks	Canada Total	Passenger Cars	Trucks	Grand Total
1930	3,355,986	2,814,452	540,534	154,192	125,442	28,750	3,510,178
1931	2,389,730	1,973,090	416,640	82,621	63,477	19,144	2,472,351
1932	1,370,678	1,135,493	235,187	60,816	50,718	10,098	1,431,494
1933	1,920,057	1,573,512	346,545	65,924	53,855	12,069	1,992,126
1934	2,753,111	2,177,919	575,192	116,852	92,647	24,205	2,869,963
1935	3,946,934	3,252,244	694,690	172,877	135,562	37,315	4,119,811
1936	4,454,115	3,669,528	784,587	162,159	128,369	33,790	4,616,274
1937	4,808,974	3,915,889	893,085	207,463	153,046	54,417	5,016,437
1938	2,489,085	2,000,985	488,100	166,086	123,761	42,325	2,655,171
1939*	3,577,292	2,866,796	710,496	155,426	108,369	47,057	3,732,718
1940	4,469,354	3,692,328	777,026	222,984	110,126	112,858	4,692,338
1941	4,838,561	3,744,300	1,094,261	270,431	94,045	176,386	5,108,992
1941							
July *	444,241	343,748	100,493	24,654	3,849	20,805	468,895
Aug.	147,600	78,529	69,071	17,192	3,160	14,032	164,792
Sept.	234,255	167,790	66,465	14,496	2,548	11,948	248,751
Oct.	382,000	295,568	86,432	19,360	5,635	13,725	401,360
Nov.	352,347	256,101	96,246	21,545	7,003	14,542	373,892
Dec.	282,205	174,962	107,243	20,313	6,651	13,662	302,518
1942							
Jan.	238,261	147,858	90,403	21,751	4,249	17,502	260,012
Feb.	134,134	52,200	81,834	20,181	3,989	16,192	154,315
Mar.	94,510	6,216	88,294	20,188	3,192	16,996	114,698

* Revised.

Note: U. S. figures represent factory sales; Canadian, production.

Exports of Crude Rubber from Principal Producing Countries

(Long Tons)

	BRITISH MALAYA							NETHERLAND INDIES						
	Gross Exports	Imports	Net Exports	Ceylon	India & Burma	Sarawak	British North Borneo	Thailand	Java & Madura	Sumatra E. Coast	Other N.I.	Indo-China	Amazon Valley	All Other	World Total
1923	252,016	70,432	181,584	39,971	6,416	5,703	4,237	1,718	32,930	46,344	57,822	3,067	16,765	7,856	406,415
1924	259,706	108,524	151,182	39,997	7,697	6,699	4,621	2,962	42,446	54,497	80,347	6,688	23,165	9,065	429,366
1925	316,825	158,022	158,803	49,566	10,082	5,424	5,377	5,377	46,757	63,499	120,626	7,881	25,298	13,797	514,487
1926	391,328	151,243	240,085	58,962	9,874	9,155	6,079	4,027	52,186	71,413	121,231	8,203	24,298	16,017	621,536
1927	371,322	182,845	188,477	55,356	11,521	10,923	6,582	5,472	55,297	77,815	142,171	8,645	28,782	15,633	606,474
1928	409,430	149,787	259,643	57,267	10,790	10,087	6,698	4,813	58,848	82,511	121,770	9,548	21,129	10,690	653,794
1929	574,836	163,092	411,744	81,584	11,663	11,077	7,381	5,018	65,990	87,789	134,037	9,696	21,148	6,767	853,894
1930	547,043	133,876	413,167	76,970	10,782	10,309	6,781	4,251	69,755	79,396	115,254	7,665	14,260	5,651	814,241
1931	519,740	125,506	394,234	61,769	8,470	10,451	6,247	4,218	75,952	87,747	116,009	11,696	12,121	3,292	792,203
1932	478,252	92,539	385,713	48,973	3,888	6,960	4,664	3,451	61,312	79,837	85,871	13,883	6,450	1,816	702,818
1933	573,412	167,377	406,035	63,351	4,527	10,874	7,555	7,765	73,851	91,861	149,659	18,394	9,883	2,737	846,312
1934	677,361	211,803	465,558	79,746	10,492	17,233	11,105	17,345	87,400	112,058	175,470	20,170	8,903	2,985	1,008,663
1935	590,319	174,652	415,667	54,316	13,968	19,465	8,885	28,327	57,488	78,325	139,297	28,816	11,275	8,745	864,574
1936	520,286	167,799	352,487	49,692	14,724	21,243	8,177	33,702	61,307	84,577	152,205	40,782	14,193	11,466	845,431
1937	681,638	213,446	468,192	70,353	17,015	25,922	13,213	5,551	84,085	139,632	207,863	43,399	15,576	13,063	1,133,864
1938	526,911	156,101	370,810	49,528	15,178	17,792	9,512	41,080	57,526	94,501	145,909	58,518	14,618	12,920	887,892
1939	553,324	177,851	375,473	61,026	15,881	24,014	11,864	41,266	72,786	117,791	181,272	65,140	13,892	22,224	1,002,629

	British Malaya [1]	N.E.I.	Ceylon [2]	India & Burma [2]	North Borneo	Sarawak	Thailand	Indo-China	Oceania	Africa [2]	Liberia	South America	Mexico (Guayule)	Grand Total
1940	540,417	536,740	88,894	23,317	17,623	35,166	43,940	64,437	2,267	10,103	7,223	17,601	4,106	1,391,834
1940:														
Sept.	58,892	44,009	9,985	1,319	1,743	2,404	3,247	9,303	100	800	323	1,295	200	133,715
Oct.	52,767	50,139	8,127	1,841	1,693	2,564	3,355	2,082	200	800	600	1,860	200	126,228
Nov.	36,045	37,387	5,623	2,626	1,130	3,360	3,463	6,715	200	800	600	1,500	200	99,649
Dec.	56,263	35,325	10,700	3,405	1,028	3,520	5,343	9,000	200	600	813	1,427	392	128,216
1941:														
Jan.	37,804	58,593	7,859	1,486	2,085	2,445	2,137	9,058	333	667	750	2,103	288	125,608
Feb.	27,115	42,091	4,332	1,421	1,686	2,922	4,137	1,995	96	854	828	1,814	414	89,705
Mar.	56,651	53,233	6,073	1,770	1,154	3,726	5,712	6,286	117	636	958	2,835	355	139,506
Apr.	40,590	48,915	6,985	1,661	2,175	3,118	4,271	....	263	864	750	2,009	423	112,024
May	53,062	48,099	7,638	1,831	1,237	3,849	1,841	6,225	156	800	180	1,080	334	126,332
June	51,247	48,496	8,925	1,056	986	3,195	2,831	7,318	200	800	919	1,510	250	127,733
July	53,373	53,429	7,387	939	1,803	3,799	3,614	3,445	200	800	750	1,253	250	131,042
Aug.	46,404	51,890	9,081	725	1,812	3,086	4,852	6,496	200	800	750	1,288	250	127,634
Sept.	70,598	65,496	6,706	145	1,371	2,495	6,524	8,000	200	800	750	1,421	250	164,756
Oct.	31,101	54,038	8,315	1,563	2,264	3,044	3,074	6,000	200	800	750	2,149	250	113,548

(1) Including Brunei and Labuan; figures shown represent rubber which has actually been shipped and include rubber from the free stocks in Singapore and Penang. (2) Exports of domestic produce. (3) Exclusive of Liberia. Notes: Figures shown prior to 1940 were furnished by the United States Department of Commerce. Figures since 1940 were furnished by the International Rubber Regulation Committee, which accounts for the difference in the principal producing countries shown. Many figures for current months are provisional only and are later revised when more definite statistics are available. Therefore, it is suggested that figures from the most recent issue should be taken as more reliable.

Net Imports of Crude Rubber into Principal Manufacturing Countries

(Long Tons)

	United States [1]	United Kingdom	France (h)	Germany	Canada (ac)	Japan (da)	Italy	Russia (ce)	Australia (cd)	Belgium (d)	Netherlands	Scandinavia (abcdf)	Spain (g)	Czechoslovakia (abcd)	Total
1919	238,407	42,671	17,685	5,584	6,395	9,753	9,894	75	1,002	3,995	2,771	3,149	2,418	9	343,808
1920	249,530	56,844	13,885	11,890	11,746	5,297	6,123	62	1,815	3,840	5,510	2,292	2,008	567	371,409
1921	179,736	42,087	15,135	21,920	8,124	21,713	3,906	165	1,014	1,705	1,022	1,279	2,245	569	300,620
1922	296,594	11,724	24,352	27,546	9,207	15,934	6,430	2,493	2,643	172	—3,807	1,778	589	567	396,222
1923	301,527	12,700	27,392	18,519	13,277	15,372	8,489	2,986	1,649	2,184	792	2,528	630	1,128	409,173
1924	319,103	—11,550	30,446	22,727	14,299	19,571	8,764	2,346	3,124	2,688	—807	3,178	944	1,370	416,203
1925	385,596	4,061	32,956	33,937	19,683	11,117	11,412	7,088	4,757	2,930	875	3,149	1,155	1,558	520,274
1926	399,981	84,865	34,240	22,775	20,229	18,125	9,809	6,529	9,021	2,498	2,670	4,046	1,290	1,870	617,957
1927	403,472	60,249	34,271	38,892	26,405	20,521	11,391	12,018	9,490	6,482	636	4,224	2,055	2,672	632,768
1928	407,572	4,84e	36,498	37,855	30,447	25,621	12,433	15,134	8,430	7,958	2,243	4,418	3,178	3,138	599,771
1929	528,608	122,675	55,093	49,275	35,453	34,284	17,169	11,774	15,886	9,445	3,022	6,440	864	4,650	894,638
1930	458,036	120,069	68,503	45,488	28,793	33,039	18,639	16,387	5,354	10,635	2,924	7,710	2,400	4,468	822,445
1931	475,993	86,170	46,466	39,688	25,261	43,483	10,149	30,671	7,649	11,009	2,220	6,360	2,605	7,717	794,641
1932	393,844	44,086	42,506	45,121	20,917	56,027	14,469	30,637	12,576	9,519	2,851	7,262	4,359	9,444	693,618
1933	398,365	73,335	61,953	54,120	19,332	66,831	19,341	29,830	13,534	11,166	1,243	7,831	5,520	10,402	772,803
1934	439,172	158,482	49,560	59,330	28,439	69,905	21,398	47,271	9,642	9,115	3,738	12,418	6,900	10,999	926,388
1935	455,758	128,829	51,450	62,899	26,870	57,567	21,880	37,572	9,978	7,593	4,068	11,878	8,140	11,245	895,727
1936	475,359	—2,591	57,032	71,794	27,871	61,223	16,534	30,967	14,109	9,648	2,888	11,236	6,668	8,772	791,510
1937	592,394	92,707	59,871	98,170	36,088	62,311	24,733	30,462	19,164	14,970	4,343	4,680	2,400	13,063	1,055,356
1938	406,343	133,079	39,660	90,200	25,696	45,836	28,170	25,650	11,944	11,309	5,092	16,034	2,400	9,936	871,349
1939	486,348				31,615	42,352			15,426	9,612	7,051				
1940	811,564														
1940:															
Feb.	41,797	7,500	5,000*	....	3,508	5,241	1,500*	2,000*	1,846	694	495	1,200*	200*	....	....
Mar.	58,302	14,200	5,000*	....	3,062	6,057	1,500*	2,000*	1,784	....	627	1,200*	200*	....	....
Apr.	70,135	16,400	5,000*	....	3,096	2,000*	1,500*	2,000*	1,612	....	....	1,200*	200*	....	.
May	50,610	10,000	5,000*	....	3,108	2,500*	1,500*	2,000*	2,128	....	....	1,200*	200*	....	....
June	53,266	9,500	5,000*	....	1,062	3,000*	1,500*	2,000*	1,181	....	....	1,200*	200*	....	....
July	69,496	19,500	5,000*	....	5,112	3,000*	1,500*	2,000*	1,902	....	....	1,200*	200*	....	....
Aug.	72,612	21,250	5,000*	....	4,605	4,500*	1,500*	2,000*	2,508	....	....	1,200*	200*	....	....
Sept.	78,306	25,940	5,000*	....	2,743	....	1,500*	2,000*	2,485	....	....	1,200*	200*	....	....
Oct.	74,400	.....	5,000*	....	8,336	....	1,500*	2,000*	590	....	....	1,200*	200*	....	....
Nov.	72,775	.....	5,000*	....	5,451	....	1,500*	2,000*	1,366	....	....	1,200*	200*	....	....
Dec.	97,794	.....	5,000*	....	7,437	....	1,500*	2,000*	721	....	....	1,200*	200*	....	....
1941:															
Jan.	86,541	.....	5,000*	....	6,290	....	1,500*	2,000*	1,065	....	....	1,200*	200*	....	....
Feb.	73,647	.....	5,000*	....	3,770	....	1,500*	2,000*	1,717	....	....	1,200*	200*	....	....
Mar.	86,794	.....	5,000*	....	3,879	....	1,500*	2,000*	3,486	....	....	1,200*	200*	....	....
Apr.	64,521	.....	5,000*	....	2,531	....	1,500*	2,000*	2,326	....	....	1,200*	200*	....	....
May	101,034	.....	5,000*	....	5,596	....	1,500*	2,000*	1,549	....	....	1,200*	200*	....	....
June	64,101	.....	5,000*	....	2,818	....	1,500*	2,000*	1,373	....	....	1,200*	200*	....	....
July	96,658	.....	5,000*	....	4,143	....	1,500*	2,000*	2,003	....	....	1,200*	200*	....	....
Aug.	105,556	.....	5,000*	....	10,683	....	1,500*	2,000*	1,251	....	....	1,200*	200*	....	....
Sept.	81,742	.....	5,000*	....	....	....	1,500*	2,000*	4,392	....	....	1,200*	200*	....	....

a—Including gutta percha. b—Including balata. c—Re-exports not deducted in monthly statistics. d—Including some scrap and reclaimed rubber. e—Official statistics of rubber imports by Soviet Russia. f—Including Norway, Sweden, Denmark and Finland. g—United Kingdom and French exports to Spain except in years prior to 1925. h—French imports have been reduced in order to eliminate imports of gutta percha and to reduce to basis of net weight. [1]—United States imports of guayule are included in this compilation. *—Figure is provisional; final figure will be shown when available.

NOTE: ANNUAL FIGURES ARE MORE ACCURATE; THEY ARE REVISED AT THE END OF THE FOLLOWING YEAR.

The WHERE-TO-BUY Section of THE RUBBER AGE in which are listed the Products and Services of the Leading Suppliers to the Industry.

The Market Place

If what you are seeking is not listed here, write to the Service Department of THE RUBBER AGE, 250 West 57th St., New York, N. Y.

Chemicals and Compounding Materials —

ACCELERATOR Z 51
- Good Aging Properties
- Free from Rapid Overcure
- Safe Processing Properties
- Low Dosages for Optimum Cures

Advance Solvents & Chem. Corp.
245 Fifth Ave. New York, N. Y.

CARBON BLACK— *Micronex*
the world's standard gas black, universally known as the "King of Rubber Pigments."

Binney & Smith Co.
41 East 42nd St. New York City

CATALPO—The universal and standard rubber pigment now being used in treads, solids, tubes, carcass frictions, etc.

Moore & Munger
33 Rector Street New York City

ACCELERATORS—
El-Sixty; Ureka; Ureka C; Guantal; Santocure; DPG; Pip Pip; A-10; A-32; A-46; A-100; R-2 Crystals • ANTIOXIDANTS—Flectol H, White; Santoflex B, BX; Santovar A.

MONSANTO CHEMICAL CO.
Rubber Service Dept.
1012 Second National Bldg., Akron, Ohio

CARBON BLACK
CONTINENTAL
The Newest Name in Carbon Black offers
CONTINENTAL DUSTLESS
CONTINENTAL COMPRESSED
CONTINENTAL UNCOMPRESSED
Continental Carbon Company
295 Madison Ave., New York, N.Y.

CHEMICALS
Carbon Black—Clay—Colors
Accelerators—Sulphur
Stocks Carried At All Times
Ernest Jacoby & Co.
79 Milk St. Boston, Mass.
Cable Address: Jacobite Boston

AERO BRAND
RUBBER CHEMICALS
DPG—DOTG—Accelerator 49
Rubber Sulphur
American Cyanamid & Chemical Corporation
30 Rockefeller Plaza, New York, N. Y.

CARBON BLACK—Aerfloted
WYEX — TX — HX
Compressed — Compact (Dustless)
J. M. Huber, Inc.
460 West 34th St. New York

CHEMICALS

For Rubber		For Industry Generally
Accelerators	*Acids*	*Latex*
Antioxidants	*Oil of Myrbane*	*Lotol*
Specialties	*Aniline Oil*	*Dispersions*

NAUGATUCK CHEMICAL
Division of United States Rubber Co.
1230 SIXTH AVE. NEW YORK

ALUMINUM FLAKE
A uniform, fine, low gravity, white reinforcing pigment. *Furnished to the rubber trade for 39 years.*

The Aluminum Flake Co.
Akron, Ohio

CARBON BLACK
"Atlantic" Carbon Blacks meet the exacting standards of modern rubber production.
Chas. Eneu Johnson & Co., Mfrs.
Distributed by
C. P. HALL CO.
Akron — Boston — Los Angeles — Chicago

CHEMICALS AND MINERAL
Ingredients—Whiting, Clay, Talc, Barytes, Colors. Heavy Calcined Magnesia. Carbonate of Magnesia, Pumice Stone.
Standard Since 1890
Whittaker, Clark & Daniels, Inc.
260 West Broadway New York

ALUMINUM HYDRATES
"Alorco" Hydrated Aluminas reinforcing pigments give many desirable properties to rubber. Send for sample.

ALUMINUM CO. OF AMERICA
1970 Gulf Bldg. Pittsburgh, Pa.

CARBON BLACK
DIXIE...KOSMOS
Used throughout the world
UNITED CARBON COMPANY
Charleston, W. Va.
New York • Akron • Chicago

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A complete line of plasticizers, resins, substitutes, fillers, etc., for Synthetic, Natural and Reclaimed Rubber.

STANDARD CHEMICAL COMPANY
Akron Savings & Loan Bldg, Akron

ANTIMONY Pentasulphide, golden and crimson, very fine, pure.

Rare Metal Products Co.
Belleville, N. J.
Direct Factory Representation

CARBON BLACK
WITCO DISPERSO
and DUSTLESS and a
Complete Line of High Quality
Rubber Chemicals
Wishnick-Tumpeer, Inc.
295 Madison Ave., New York, N.Y.

CHEMICALS
For Natural & Synthetic Rubber "PICCO" Brand—Plasticizers; Coumarone Resins; Reclaiming Oils, Coal Tar Naphthas.

Pennsylvania Industrial Chem. Corp.
Clairton Penna.

CALCENE— The Ideal low gravity, white reinforcing pigment. Gives high tensile and elongation properties with exceptionally good resistance to tear and abrasion.
PITTSBURGH PLATE GLASS CO.,
COLUMBIA CHEMICAL DIV.
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Do you believe in Your Products?
Then you should believe in telling the rubber industry about them. The MARKET PLACE is the logical place to display your wares.

COAL TAR CHEMICALS
Coumarone Resins **Tack Producers**
Resinous Oils **Dispersing Oils**
Reclaiming Oils **Softeners**
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The Neville Company
Neville Island, Pittsburgh, Penna.

The Market Place

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Chemicals and Compounding Materials (continued)

COLLOIDAL SULPHUR
COLLOIDAL ZINC OXIDE
COLLOIDAL COLORS

HEVEATEX CORPORATION
78 Goodyear Ave. Malrose, Mass.
Offices in New York, Akron, Chicago

FACTICE—Prevents blooming, makes colors fast and a smoother batch.

Stamford Rubber Supply Co.
Stamford, Conn.

PARA-DORS—
overcome odors in rubber—effectively and at low cost.

GIVAUDAN-DELAWANNA, INC.
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330 West 42nd St., New York, N. Y.

COLORS
BRILLIANT ORGANIC DYES; PERMANENT, NON-BLEEDING, LOW COST
For All Cures

MONSANTO CHEMICAL CO.
Rubber Service Dept.
1012 Second National Bldg., Akron, Ohio

FURNEX—FURNEX BEADS
—A cool mixing reinforcing black for Footwear and Mechanicals. Good ageing —Improved oil resistance.

Binney & Smith Co.
41 East 42nd St. New York City

PARA-FLUX
The Universal Softener—Adaptable, Uniform. Improves Quality—Economical.

The C. P. Hall Co.
2510 First Central Tower
Akron Ohio

COMPOUNDING Materials

Vulcanizing Agents	Pigments
Accelerators	Clays
Antioxidants	Mineral Rubber
Plasticisers	Aromatics
Dispersions	Blacks

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230 Park Ave. New York City

GASTEX
Special Process Reinforcing BLACK. Superior aging and oil resistant properties. Low permanent set.
GENERAL ATLAS CARBON DIV.,
GENERAL PROPERTIES CO., INC.
60 Wall St. New York

PELLETEX (The pellet *Gastex*)
The special process reinforcing black in free-flowing form. Saves power; none wasted; protects adjacent colored stocks.
GENERAL ATLAS CARBON DIV.,
GENERAL PROPERTIES CO., INC.
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CROWN CLAY
An Approved Clay for Rubber Compounding

Southeastern Clay Co.
Aiken South Carolina

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Asbestine—Barytes—Talc—Soapstone

C. K. Williams & Co.
EASTON, PA.

RUBBER PROCESSING OILS
For outstanding compatibility in processing natural or modern synthetic rubbers, use
SUN RUBBER PROCESSING OILS
Write
SUN OIL COMPANY
Philadelphia Pennsylvania

CUMAR —Paracoumarone Resin.
A neutral gum for rubber compounding.
Samples and prices on request.
The Barrett Div.
Allied Chemical & Dye Corp.
40 Rector St. New York City

MAGNESIUM OXIDE
Calcined Magnesium Oxide prepared for use in the compounding of neoprene. Full details on request.

J. T. Baker Chemical Co.
Phillipsburg New Jersey

RUBBER SUBSTITUTES
White, brown and black.

The Carter Bell Mfg. Co.
Springfield, New Jersey

DU PONT Rubber Chemicals
DU PONT RUBBER COLORS
DU PONT ACCELERATORS
DU PONT ANTI-OXIDANTS
E. I. du Pont de Nemours & Co., Inc.
RUBBER CHEMICALS DIVISION
WILMINGTON, DELAWARE

MAPICO COLORS
Pure Oxides of Iron
Yellows—Reds—Browns—Black
MAGNETIC PIGMENT CO.
Manufacturers
BINNEY & SMITH CO.
Distributors
41 East 42nd Street, New York, N. Y.

SOFTENERS
Rosin Oil — Pine Tar
Burgundy Pitch
"Galex" — a non-oxidizing Resin

National Rosin Oil & Size Co.
RKO Bldg. New York, N. Y.

EXTENDER
NAFTOLEN R 100 — Extender for Crude Rubber, Reclaim, Synthetics.

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MOLD LUBRICANT
"Orvus" enables articles to leave molds readily; molds clean easily. Effective in hardest water. Also acts as thorough cleanser for molded and extruded rubber goods.

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SOLVENTS
"Skellysolve"—A superior solvent in six different types for various uses—for making rubber cements—for many different rubber fabricating operations.

SKELLY OIL CO., SOLVENTS DIV.
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The Market Place

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Chemicals and Compounding Materials (continued)

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STEAREX . . . CAKE or POWDER
STEAREX BEAD
Standardized Products for Rubber Compounding
MINERAL RUBBER (Parmr), TALC
SOAPSTONE
Binney & Smith Co.
41 East 42nd St. New York City

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Johnson's lustrous wax finishes retard oxidation, reduce friction, surface wear, tackiness.
S. C. JOHNSON & SON, INC.
Racine Wisc.

ZINC OXIDE PIGMENTS
The XX Reds Kadox
ZINC SULPHIDE PIGMENTS
The Cryptones The Albaliths (Lithopones)
The New Jersey Zinc Sales Co.
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SULPHURS
Rubbermakers' TIRE BRAND and TUBE BRAND. Also CRYSTEX Insoluble Sulphur, Sulphur Chloride, Caustic Soda, Carbon Bi-Sulphide, Carbon Tetra-Chloride.
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AZO ZZZ Zinc Oxides
lead free—pure—uniform—dependable
AZO ZZZ-11 AZO ZZZ-55
AZO ZZZ-22 AZO ZZZ-44 AZO ZZZ-66
American Zinc Sales Company
Columbus, Ohio *New York*
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ZINC OXIDES
Black Label Red Label Green Label
Manufactured by Our New Electrothermic Process
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250 Park Ave., New York
Plant and Laboratory: Monaca (Josephtown), Pa.

TITANIUM PIGMENTS
TITANOX-A (Titanium Dioxide)
TITANOX-B (Titanium Barium Pigment)
TITANOX-C (Titanium Calcium Pigment)
TITANOX-L (Lead Titanate)
TITANIUM PIGMENT CORP.
SELLING AGENTS
111 Broadway, New York, N. Y.
104 S. Michigan Ave., Chicago, Ill.

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ZINC STEARATE
ZINC LAURATE
Colite Mold Lubricant for Extra High Gloss
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BANBURYS REPAIRED
Re-building and re-surfacing rotors and mixing chambers has been our specialty for years.
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DIAL GAUGES—Thickness
For measuring the thickness of rubber and similar materials. Many models.
Frank E. Randall
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GRINDING MILLS
SPAN grinding mill reduces soft and hard rubber to fine powder.
Made in U. S. A.
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CALENDER SHELLS
Gammeter's
ALL STEEL Calender Shells.
All welded. Any size.
New and better.
The W. F. GAMMETER CO.
Cadiz Ohio

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For Synthetic Rubber, Reclaimed Rubber, Latex Processed Materials, etc.
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MACHINERY
L. ALBERT & SON
Trenton, N. J. Akron, O.
Los Angeles, Calif.

CUTTING DIES
Cutting and perforating dies of all types for rubber manufacturers.
Send for our quotations
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The pioneer line of tubers, strainers and wire insulating machines. For latest developments inquire of
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Paterson New Jersey

MACHINERY—RUBBER
"MASTER" Tube Molds, Tire Vulcanizers, Molds and Cores, Tire Drums, Tubers, etc.
Special Machinery Built to Order
Akron Standard Mold Co.
Akron, Ohio

CUTTING MACHINERY
Specialists in Rubber Cutting Equipment for Bands, Crude Stock, Jar Rings, Tubes, Rollers, Washers, Treads, Cement Stock, etc.
See Black Rock for All Cutting Problems
Black Rock Manufacturing Co.
179 Osborne St. Bridgeport, Conn.

FORMS - PORCELAIN
Exclusive Manufacturers of Vitreous Porcelain Closed End Forms
No matter what shape or design—we can make it. Send blue print or sketch for our prices.
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Cutting, Trimming, Skiving, Cementing, Eyeletting, Cutting Dies—Eyelets.
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Layouts — Formulas — Processes
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For tires, rubber specialties and mechanical goods; general machine work.
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RUBBER TENSILE TEST MACHINES
TEXTILE TESTING MACHINES
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Clutches Brakes
Rolls Special Magnets
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For Quality and Efficiency in Working Rubber. Consult us about your problems.
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Atlas Twin-Arc Weather-Ometer duplicates outdoor weather conditions. Economical—dependable—efficient.
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A Type for Every Need—Large Diameter—Light Weight — Extra Strong — Seamless.
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Hartford, Conn. Akron, Ohio

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The National X-1-A Accelerated Weathering Unit quietly evaluates substitute materials, new formulas, established products.
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GUAYULE RUBBER
produced by our affiliated company
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SCRAP RUBBER
HARD RUBBER DUST
BALATA — GUTTA PERCHA
Hermann Weber Company
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LATEX
Normal, Concentrated, Processed
HEVEATEX CORPORATION
78 Goodyear Ave., Melrose, Mass.
Offices in New York, Akron, Chicago

CREPE RUBBER
Specialists in Latex Crepe
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Ready to use
NAUGATUCK CHEMICAL
Division of United States Rubber Co.
Rockefeller Center, New York, N. Y.
Offices in Detroit, Boston, Indianapolis

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LATEX, BALATA
GUTTA-PERCHA, GUTTA-SIAK
Robert Badenhop Corporation
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DISPERSITE
Water Dispersed Rubber
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Man-made Alternate for Latex
Dispersions Process, Inc.
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Offices in Detroit, Boston, Indianapolis

REVERTEX
Highly Concentrated (About 75%)
Rubber Latex
Sole Distributor for U. S. A. and Canada
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CRUDE RUBBER
SCRAP RUBBER
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THE MARKET PLACE
Show What You Have to Sell

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Rubber [Cont'd]

RUBBER—
Scrap and Crude
Also HARD RUBBER DUST
A. Schulman, Inc.
Darrow Road, Akron, Ohio
1401 Mississippi Ave., E. St. Louis, Ill.
736 Statler Bldg., Boston, Mass.
Warehouses at Akron and E. St. Louis

VULTEX— THE ONLY VULCANIZED LATEX
Insures Highest Quality, Uniformity, Economy, Simplicity of Application
FULLY PROTECTED BY PATENTS
Also Latex and Latex Compounds
General Latex & Chemical Corp.
Successors to the Vultex Chemical Company
666 Main St. Cambridge, Mass.

The Progressive Concern Selling to Rubber Manufacturers Uses THE MARKET PLACE for Results

Reclaimed Rubber . . . .

NERVASTRAL RECLAIMING PROCESSES
HIGH GRADE — HIGH SPEED
HIGH ECONOMY
Rubber & Plastics Compounds Co., Inc.
30 Rockefeller Plaza, New York, N. Y.
Tel: COlumbus 5-0085

RECLAIMED RUBBER—
For All Purposes
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